ASSESSING THE SOCIAL SUSTAINABILITY OF CHINESE URBAN NEIGHBOURHOODS: A CASE STUDY OF SHENZHEN

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Abstract

There is an increasing concern arising from China's recent urban growth in terms of sustainability from environmental, economic and social perspectives. Huge numbers of new Chinese urban neighbourhoods have been built during the past 20 years with great spatial and social changes in this process compared with the past. However, little attention has been paid to assess the planning and development of these new neighbourhoods against social sustainable criterion. This research aims to evaluate the social sustainability of new Chinese neighbourhoods and discuss its association with patterns of urban form and related planning processes. A new conceptual framework of social sustainability was developed from the relevant sustainable research based upon the Western experiences and adapted to the Chinese urban context. It included three layers, resident's basic needs, inner social networks and the entire community development for which detailed indicators could be generated as the basis for empirical social sustainability assessments.

An embedded case study methodology was applied to Shenzhen, a new megacity rising from China's rapid urbanisation process. The methodology consisted of two-phase case studies and utilised multiple survey methods. The city-level focused on understanding the macro-context policies related to neighbourhood development process and the general spatial characteristics of urban form, in which typical patterns could be identified for neighbourhood case selection. Then neighbourhood-level case studies in the Houhai-Dengliang area were used to appraise their levels of social sustainability. The analysis suggests that there is nexus between urban form and social sustainability, with the recently emerging highly-segmented and over-intensified developments being the least socially sustainable form. Defects in the current neighbourhood development mechanisms are further identified based on the clear evidence. The research recommends that the 'site scale' and 'density' needs to be effectively controlled for new neighbourhoods, within medium ranges, if the best level of social sustainability are to be achieved. For many existing neighbourhoods, evidence also indicates that adopting a collaborative planning approach can be a pathway towards a more socially sustainable development.

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Abbreviations and Acronyms

SS	Site scale	BCR	Building coverage ratio
FAR	Floor area ratio	Dp	Population density
SZPL	Urban Planning & Land Resource Commission of Shenzhen Municipality		
SUPRC	Shenzhen Urban & Land Resources Planning Research Centre		
CPDP	Conditions for planning and development permission		
HD	Houhai-Dengliang		

Acronyms for neighbourhood patterns

LSMD	Large-scale medium-density	MSMD	Medium-scale medium-density
LSLD	Large-scale low-density	MSLD	Medium-scale low-density
LSHD	large-scale high-density	MSHD	Medium-scale high-density
SSMD	Small-scale medium-density	SSLD	Small-scale low-density
SSHD	Small-scale high-density		

Abbreviations used in social sustainability appraisal

SF_ED	Satisfaction with educational facilities	LTS	Length of time spend on activities
SF_HE	Satisfaction with healthy facilities	SWP	Subjective willingness to participate in activities
SF_CM	Satisfaction with commercial facilities	OFI	Objective frequency of interaction
SF_SW	Satisfaction with social welfare facilities	SII	Spatial Intensity of interaction
SF_CL	Satisfaction with cultural facilities	SSI	Social strength of interaction
SF_SP	Satisfaction with sports facilities		
SF_PU	Satisfaction with public space	OST	Occupancy stability
SF_IS	Satisfaction with inner surroundings	PST	Population stability
SF_TR	Satisfaction with public transportation	OSA	Objective safety
SF_PK	Satisfaction with parking spaces	PSA	Perceived safety
		SF-PM	Satisfaction with property management
SOB	Sense of belonging	SF-CS	Satisfaction with community service
PNC	Perception of neighbourhood character	PA-PM	Property management participation
NMR	Neighbour mutual recognition	PA-CA	Committee affair participation
NMH	Neighbour mutual helpfulness	NSG	Neighbourhood self-governance
SGM	Social group membership	NMC	Neighbourhood mutual collaboration

List of Publications

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1. RESEARCH INTRODUCTION

1.1 Planning for socially sustainable neighbourhoods, a global concern

Sustainability has been given high attention since the last century, from the World Commission's report (Brundtland, 1987) on environment and development, to the United Nations Conference on Environment & Development 1992 and the European Community report 'Towards Sustainability' (Commission, 1993). Now a compulsory specific 'Strategic Sustainability Performance Plan' has been fully implemented in the United States and is updated annually, according to which all federal agency needs to submit a strategy for a governmental review (Dion, 2013).

It is well accepted that sustainability should be equally balanced among all three dimensions, environment, economy and society (Jones and Evans, 2008, Roseland, 2000, McDonald, 1996); the components and links between the three dimensions are also discussed (Faber et al., 2005, Vallance et al., 2011). Environmental sustainability mostly deals with water and air quality, waste management and coastal urbanisation; economical sustainability has particular focuses (Bobker, 2006, Faber et al., 2005), for example, regional growth through infrastructure investment, energy efficiency in green technology, creative clusters for local revitalization. Compared to the previous two elements, social sustainability starts from a bottom-up perspective and is concerned with people themselves. A special focus of social sustainability may include individual liveability, residential population change, community groups and networking, neighbourhood management, etc. Social sustainability also embodies the spirit of social justice. It emphasises the establishment of an equally happy and harmonious society. It is not an illusory concept, it can be reflected and computed by exploring residents' perceptions of their quality of life as well as their sense of the whole neighbourhood network (Dempsey et al., 2011). Recently it has become a worldwide important research topic (Colantonio, 2008, Ghahramanpouri et al., 2013).

However, internal contradictions of sustainability can be seen from the tensions between these three dimensions, for instance, the well-known issue that urban economic development should not be at the cost of the decline of the natural environment (Pope et al., 2004). The conflict between economic and social development is often reflected in the choice of efficiency and fairness of urban development (Ghahramanpouri et al., 2013, Thomas and Hwang, 2003). Emphasised by government officers and investors, policies promoting economic growth often show great enthusiasm for pursuing efficiency. Social equity is often stressed in societal policies that aim to provide grass roots-based social service and eventually mend the gap between the rich and poor (Oliveira, 2012). Additionally, the contradiction between the environmental and social dimensions is also noticeable. It is commonly accepted that human society cannot survive without the natural environment (Curwell et al., 2005). Therefore, it is crucial that social development, e.g. population growth, should not exceed the environmental capacity (Heberle and Opp, 2008). More specifically, recent urban development has strongly emphasised the need for an integrated ecosystem (Tzoulas et al., 2007). However, there have been increasing risks and conflicts in terms of sustainability and its different dimensions in recent global urbanisation processes (Rajesh Kumar et al., 2009). The establishment of warning and evaluation mechanisms is commonly suggested by studies (Devuyst, 1999, Vreeker et al., 2009) to avoid a sustainability crisis. Thus, a 'corporate sustainability' is necessary as 'a set of systematically interconnected and interdependent economic, environmental and social concerns at different levels that firms are expected to address simultaneously' (Hahn et al., 2015,p.299).

The concern for social sustainability in the area of urban planning emerged in the late 20th century. 'Social planning' theory, greatly contributed to by many non-planners like Jacobs, Davidoff and Harvey, with their distinctive social perspectives, has been gradually adopted into planning theory. For instance, in the 1960s Jacobs wrote about communities' everyday social lives in American neighbourhoods, criticizing modern planning in North America for a serious lack of concern about people's social lives inside their cities (Jacobs, 1961). Inspired

by the greater vigour of academic concerns, most of the important new planning concepts after the 1980s have all claimed their distinctive ways of achieving good social impacts through their planning practice. 'New urbanism' and 'Compact city' are claimed by their followers have at their heart the notion of promoting social sustainability, through for example, urban policy dealing with the sprawling Western urban form, including increasing density for more social interaction and using pedestrian-friendly urban design. Moreover, planning strategies carried out after the 2000s, such as socially mixed housing policy sought to mitigate against social exclusion (Atkinson and Davoudi, 2000, Madanipour et al., 2002).

Sustainable development is a broadly used concept as discussed, and is now being increasingly considered in the context of an urban neighbourhood and its planning process. There are a number of current and relevant studies regarding the increasingly popular topic of 'sustainable neighbourhood' in planning (Garde et al., 2010, Choguill, 2008, Rudlin and Falk, 2009). Neighbourhood social sustainability has undoubtedly become an important planning perspective (Roseland, 2000, Magis, 2010). Although its definition and exact meaning have not been clearly agreed, researchers promoting social sustainability are mainly discussing the individual quality of life and the function of the whole community and society. These two parts can be seen as the main component embedding the core intrinsic values of social sustainability. Socially sustainable communities can create a potential pride in their residents as well as a good sense of belonging (Davidson, 2010, Cuthill, 2010). Good social sustainability has thus become an indisputable goal for neighbourhood planners. Planners are continually rethinking how the urban form could and should be created with particular consideration of the social impact (Yiftachel and Hedgcock, 1993). Under this trend, more comprehensive planning principles are proposed and advocated, as the social perspective should not be sacrificed for other biased goals, either economic achievement or aesthetic design (Roseland, 2000). Researchers (Magee et al., 2012, Davidson, 2010) have advised that sufficient planning consideration must be paid to the social perspective for future new neighbourhoods throughout the whole decision-making process of neighbourhood creation or reconstruction.

1.2 Rapid growth of urban neighbourhoods in China, challenges with social sustainability

1.2.1 Spatial and social changes in the rapid urbanisation and neighbourhood development

China's high-speed urbanisation started in the 1980s after the implementation of the national reform policy. The urban built areas of its large cities were greatly expanded between the 1990s and 2000s. As a typical phenomenon, urban neighbourhoods were constructed rapidly after 1997 when the housing development was opened to the market place. Based on a large population and limited land use, there was a great demand for new urban neighbourhoods to accommodate the continuing growth of the urban population, which is mostly contributed to by rural immigrants. It created a 'gold-rush' period for real-estate developers. As land provision was also part of the local economy drive[1] with local authorities achieving great profit by offering lands for private development.

More and more traditional neighbourhoods are disappearing. Many urban villages are suddenly shaped and surrounded by modern high-rises. Housing types and architectural styles are becoming greatly varied as well. The phenomenon of 'fragmentation' not only appears in terms of urban form but also in the social structure of inhabitants. Now in some mega Chinese cities like Beijing, Shanghai, Guangzhou and Shenzhen, many neighbourhoods are smaller than ever, but composed of increasing diverse groups of people from everywhere in the country. As Western nations have experienced fragmentation within their cities in recent decades (Ancell and Thompson-Fawcett, 2008), now the Chinese cities are also experiencing a similar fate.

There have been huge criticisms of the destruction of traditional urban texture and the loss of cultural continuity (Douglass et al., 2012). Social problems have started to appear with

[1] The local land selling has become an important tax inclusion since 1997, when the national government established a new split national-local tax system.

the urban transformation led by the massive new urban neighbourhood development (Shen and Wu, 2012). Many Chinese residents find it strange that the number of neighbours they may know and interact with is becoming fewer and fewer, although more people seem to be living together within a neighbourhood. Social differentiation and social exclusion have also appeared with the transformation of urban neighbourhoods. Many newly built urban neighbourhoods are believed to be only 'dormitory housing in dormitory towns', with little sense of place (Han and Gao, 2009). For this study, it is eager and crucial to discover the real social outcomes of the recent urban neighbourhood development.

1.2.2 The suspected urban form and inadequate planning concern

Sustainable urban form is being accepted as a key challenge for Chinese planners and the associated urban planning and urban design processes (Gao, 2002, Geng et al., 2007). The social uncertainty with current modes of neighbourhood development is facing increased criticisms, for example, the loss of cultural continuity and the destruction of traditional urban texture (Gu et al., 2008, Liu et al., 2010a). The great mixture of different patterns of neighbourhoods also creates new challenges for Chinese planners, as the urban environment of many cities has become highly fragmented and disordered.

The question could firstly go to the current urban form control platform, the Chinese regulatory planning system, which is regarded as the core with a series of control variables. Nowadays encouraged by the 'compact city' theory that has an increasing acceptance in China (Peng, 2008), a high-density form has been frequently used as a model providing a rational use of the limited land. However, a compact city should not be a crowded city, should not be at the expense of the environment and should not scarify the quality of life caused by spatial compression (Geng, 2008). Thus, a big question needs to be answered is whether the guidelines and orientations that have been adopted for shaping urban form are indeed proper under the criterion of social sustainability.

Secondly, the planning process may need to be rethought. Although achieving sustainable communities has been agreed to be of great significance (Bramley et al., 2009, Bramley and Kirk, 2005), the current planning input in China is indeterminate and even questionable. Many planning strategies and even the planning system itself need to be reviewed again according to the increasing expectation of delivering social sustainability. Now new housing and neighbourhood projects have to focus on improving quality of life and creating socially sustainable communities instead of their initial purpose of providing accommodations for the quickly increasing population (Wu, 2002). However, it becomes complicated when inquiring what the current planning system has done in promoting social sustainability. The neighbourhood planning mechanism itself has not been clearly established in China and the planning input at the neighbourhood level may not be adequate (Wu et al., 2010). Besides the physical regulation on forms which may be improper or ineffective, separates controls in different hierarchies, diversified investment from developers and fragmented management of gated neighbourhoods may also in fact hinder the promotion of a neighbourhood's social sustainability in practice (Xu and Chan, 2011, Shen, 2007).

Furthermore, there are few direct studies examining the level of social sustainability for the greatly developed new urban neighbourhoods as part of the rapid urbanisation process in China. From a Western perspective, the exploration of the relationship between urban form and social sustainability, although producing some initial findings, is still far from a clear discourse. This is partly due to the vague notion of social sustainability itself. At present, great debates still exist in the current discussions; this is from an enlarged scene with more narratives from different urban contexts, not only in the West but also in the Middle East and the Far East. However, as there is no 'once and for all' result in the planning research, the lack of empirical studies with Chinese local contexts seem to be more fatal. More specifically, academic concerns about the social sustainability issue that have emerged since the last century are almost all drawn from Western planning content. But under different urban contexts, different results could occur for a planning policy. For example, although the 'compact city' is supposed to be a sustainable strategy in the West, the

meaning and counter measures may have to be revised or adjusted in the Chinese urban context. The question of this research would finally come from an empirical socially sustainable assessment for the new urban Chinese neighbourhoods that developed since the 1990s. A deeper connection can also be made linking the social outcomes with the urban form and its shaping process. A China-based research then should be able to fill a potential gap that exists in the literature and make a special contribution to the social sustainability series. The exploration of this theme can also provide important implications for future planning strategies.

1.3 Justification for this research

The initial point of this research is to identify the importance of social sustainability at the level of neighbourhood. Theoretical studies by researchers have provided discussions on the definition, inclusion of social sustainability and some extended policy indications (McKenzie, 2004, Davidson, 2010). However, a gap between theory and practice is clear and should never be neglected. The full implementation of a clear social sustainability framework is of great importance for neighbourhood planning and urban policy-making in both the Western and Chinese contexts. Although Chinese planning practitioners have started to show some concern about good urban form, proper planning regulations and urban policies cannot be devised without a real understanding of the important nexus between urban form and social sustainability.

The first big question that needs to be answered is still about the creation of urban form. Facing a world debate on the choice of urban dispersion or concentration, Chinese planners have orientated themselves towards concentrated development, and continuous constructions of more compact and intensified urban neighbourhoods. The necessity of this drive is to deepen the understanding of the spatial transformation happened in Chinese cities, especially regarding the largely emerged new urban neighbourhoods. Massively developed between the 1980s and 1990s when a mature planning system had not been set up, many Chinese urban neighbourhoods were shaped in multiple ways with dynamic

mechanisms during this extremely rapid urbanisation process. Thus, it is important to know how the current spatial movements happened in recent new urban development in China, for instance, how the variable density has been changed in the planning of new neighbourhoods. A targeted study about the current spatial characteristics of urban Chinese neighbourhoods can hopefully provide a clear understanding of the general tendencies of spatial transformation in Chinese cities. According to relevant studies (Meta Berghauser Pont and Haupt, 2010, Chen, 2003), urban form can be created into many diverse patterns. Additionally, it is impossible to provide an equal treatment of the present sophisticated Chinese urban context, which is a mixture of newly planned gated neighbourhoods, urban villages as well as other types of dwellings. As a result, a distinctive selection of current patterns of urban neighbourhood with a special focus is essential.

Secondly, this research seeks to develop a feasible approach to assess social sustainability for urban neighbourhoods together with a deep review of the process of neighbourhood development in China. Social sustainability has not been integrated into the planning process and the configuration of urban form. It is first because the levels of social sustainability for most neighbourhood patterns are not yet known so far. Consequently, the second necessity of this study lies in an assessment of different patterns of neighbourhoods in terms of their social sustainability. It would be interesting to see whether the results are random or discretely related to urban form and to what extent could urban form influence social sustainability.

Furthermore, a deep critical review of the urban form shaping process may also be able to find the explanations to their potentially varied levels of socially sustainability and influencing factors in the planning process. As unsustainable patterns may be suggested by the assessment results, it is worth discussing whether they are created due to an oversight of individual planners or a deep planning system defect. Thus, the value of the research is not only for exploring the present but also for building the future. So hopefully the outcome from this research can be recommendations for the Chinese planning process as a whole.

As detailed planning principles and guidelines for good social neighbourhoods have been rarely provided, the outcome may firstly contribute to potential solutions for shaping a more socially sustainable neighbourhood via optimising the urban form. However, attention may also need to be paid to the enhancement of many existing neighbourhoods via other feasible approaches besides the adjustment of urban form.

Last but not least, it is important to rethink about whether and how the findings could be returned to the planning mechanism. A deep understanding of the current attitude of planners behind the configuration of urban form is important. From what they think, how they control and determine urban form and what it stands for, the value of the current planning system can be recognised. It is also essential to consider the multiple stakeholders in the planning process. The roles played among planning bureau, governmental planners, developers, community service providers and residents are very complex and need further exploration. Can any trade-off be found in planning policy or is there already an effective decision-making process in the system? The final question for the planning system to answer is how to establish a responsible mechanism for making socially sustainable neighbourhoods. Reviewing community planning mechanisms worldwide, including the popular collaborative planning and community architecture approaches, suggests there is definite space for improvement in the Chinese planning system. This is also something the research fully seeks to do.

To sum up, so far there is no clear answer concerning the relationship between urban form and social sustainability in China. The motivation for this research mainly comes from a desire to identify the current characteristics of urban Chinese neighbourhoods and to assess the level of social sustainability for typical neighbourhood patterns. Recommendations can be drawn up to improve future neighbourhood development and indeed the entire Chinese planning system.

1.4 Research aim and objectives

The overall aim of this thesis is to assess social sustainability for new Chinese urban neighbourhoods.

There are four objectives developed to achieve this clear goal.

1. To understand the urban form creation process and typical patterns of Chinese new urban neighbourhoods
2. To establish a framework to evaluate neighbourhood social sustainability.
3. To assess the levels of social sustainability for certain typical neighbourhood patterns and understand the relationship between social sustainability and urban form
4. To identify the potential weaknesses in the current planning process and consider how more socially sustainable neighbourhoods could be shaped in the future.

1.5 Research methodology

The key research methodology is a grounded approach assessing social sustainability for Chinese urban neighbourhoods, which is mainly from a case study examining patterns of local neighbourhoods and the planning process in Shenzhen. The research is carried out in four key stages under the four objectives, which shapes the structure of this thesis. The first stage of this research is a theoretical review of the urban neighbourhoods in China and its shaping process. A historical review of the evolution of the neighbourhood concept in China is the foundation alongside an understanding of how urban form and neighbourhoods have been shaped by the planning process. In the second stage, a framework for assessing the social sustainability of urban Chinese neighbourhoods is conceptualised. The empirical social sustainability indexes are generated with a series of detailed indicators, which could be directly used in the following empirical assessment. The third step is an implementation of a case study in the city of Shenzhen. The real local urban form patterns have to be firstly classified. The most important task in this stage is to assess the social sustainability of different patterns of neighbourhoods. Analyses will also be formulated for discovering the potential social-spatial nexus. The last stage of this research focuses on identifying the potential defects in the planning process based on the outcomes of social sustainability

appraisal. Local planning systems are reviewed to understand the planning and governance approaches of local neighbourhood development as well as the roles of those stakeholders involved. The final recommendations for the local planning system can be formulated based on the research findings.

1.6 Thesis structure

The whole thesis is divided into four parts following the methodological structure: conceptualization, case study selection, presentation of results and findings, conclusion. Eleven chapters are produced under this general constitution of the thesis (Figure 1.1).

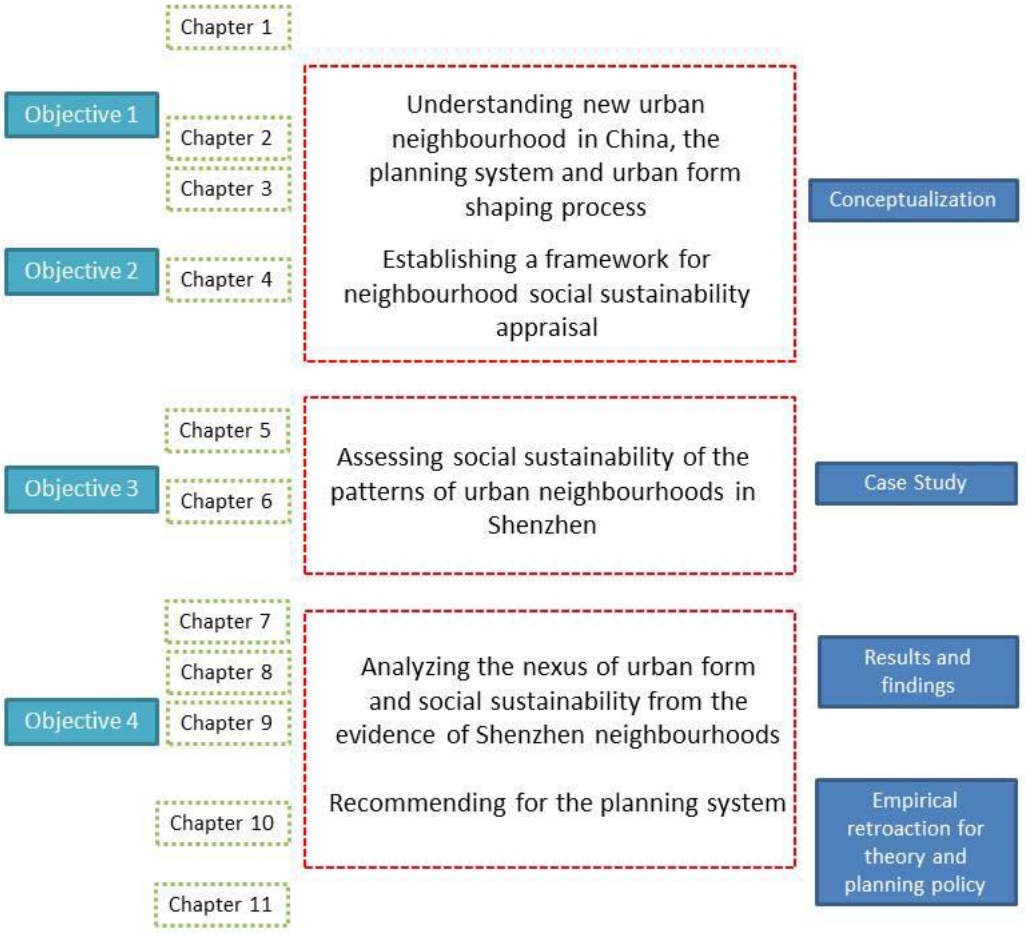

Figure 1.1 The thesis structure

Part One: Conceptualization

Chapter One: The research introduction

Chapter Two : Spatial and Social Transformation of Urban Neighbourhoods in China

This chapter mainly discusses what a neighbourhood is in China. It starts with the evolution of Chinese neighbourhoods and reveals their current characteristics. It is found that the current texture of neighbourhoods in China is a great mixture of different types, which have been complexly shaped by different driving forces and mechanisms. Further clarifications are made for the governance of urban neighbourhoods. As an early filter for the next stage, urban form classification, the study re-defines the concept of urban neighbourhood by excluding certain types which are judged to be irrelevant.

Chapter Three：Neighbourhood Related Planning Processes In China, Variables and Urban Form Patterns

This chapter mainly discusses the urban form's shaping process in China, where the planning system seems to be complicated and needs further clarification. This chapter includes a review of the entire neighbourhood planning process and a particular examination of the consideration of the aspect of social sustainability in this process. Generally, the country has set up a top-down planning system and the development of neighbourhoods everywhere follows almost the same procedure. An understanding of the current way that planners create the urban form is also vital. The core variables, the site scale and floor area ratio which control the urban form horizontally and vertically, are identified through this system review. A theoretical classification of the patterns of urban form is also made.

Chapter Four:The Framework of Neighbourhood Social Sustainability and Its Indicators

A theory gap is found in assessing neighbourhood social sustainability after a general literature review of this research area. A new framework for assessing Chinese neighbourhood social sustainability is formulated, based on a summary of the relevant worldwide discussion of social sustainability appraisal in recent theoretical studies and planning practices. The framework has a three-layered hierarchy discussing basic needs, social networks and community development at three different levels. The assessment of

social sustainability adopts an indicator method. Following the indications of literature, a series of key indicators are eventually generated. They are also organised and adapted particularly for a practical assessment in the unique Chinese urban neighbourhood context.

Part Two: Case Study Methodology

Chapter Five: A Case Study in Shenzhen and its methodology

Following the previous conceptualisation, research tests the theoretical hypothesis by a practical demonstration in the special city, Shenzhen. This chapter mainly discusses the case study methods. The rationale of choosing this city is firstly discussed. As a top mega city in south China, Shenzhen has the fastest speed of urbanisation which represents modern China's vast urban transformation. Detailed case study methodology is then developed in this chapter, which implements case studies at both the city level and neighbourhood level following a logical structure and a designed procedure. This embedded case study requires a full collection of the necessary data. Thus different survey methods were conducted in the case study phase, which included documentary, interview, observation and questionnaire methods. The ethical considerations and data analysis methods are also reported in this chapter.

Chapter Six: Marco-context of Shenzhen and the Selection of Neighbourhood Cases

With the implementation of a case study in Shenzhen, this chapter describes the macro contexts of Shenzhen and neighbourhood case selection. Firstly, it explains the local planning system and describes the current planning inputs in promoting social sustainable development, in which a clear planning gap at the bottom neighbourhood scale is exposed. Secondly, the local urban form characteristics are probed in this chapter. Residential lands and variables of site scale and density were quantitatively analysed using the city GIS spatial data. From these grounded investigation, the patterns of local neighbourhoods could be practically defined and categorised following the theoretical construction in Chapter 3. Neighbourhood cases were selected and a special examination of local neighbourhood

social sustainability was carried out in the area of Houhai-Dengliang, where typical neighbourhood patterns could be found.

Part Three: Presentation of findings and Results

Chapters Seven, Eight and Nine: Neighbourhood Social Sustainability Appraisal

These three similar chapters presents a systematic social sustainability appraisal of the patterns of urban neighbourhoods in Shenzhen. They follow the three-layered framework generated in Chapter 4. Chapter 7 assesses the layer of 'Basic needs'; 'Social network', the second layer of the appraisal, is discussed in Chapter 8. Chapter 9 has a specific concern regarding the layer of 'Community development'. The major part of analysis compares variances of social sustainability in different neighbourhood patterns using the established, detailed indicators. The appraisal results are synthetically presented by the Z-score method and visualised to reveal the overall ranking of different patterns. Regarding the social sustainability appraisal outcome, explanations from the related planning inputs are also addressed. For example, potentially different impacts of different variables such as site scale and density are discovered, which could be important indications for the related planning regulations.

Part Four Conclusions

Chapter Ten: Planning recommendations

The previous three-layered assessment has interpreted the relationship between urban form and social sustainability and identified certain unsustainable patterns that have been created in practice. The research is going to find what caused the problem and how it was caused. There is a further review of the local planning process along with a discussion of the relationships between the involved stakeholders, through which the causalities are identified and the system defects are exposed. Planning recommendations towards a more socially sustainable neighbourhood development are thus generated as the final part of this thesis.

Chapter Eleven: Thesis Conclusion

This chapter provides a summary of the whole thesis. The key findings are summarised by revisiting the research objectives and the actual achievements. The findings include several parts, a review of the emerged issues of neighbourhood development in China, a theoretical construction of neighbourhood social sustainability, an empirical assessment applied in the case of Shenzhen, and finally, recommendations based on the identification of the defects of the current planning process. However, there are also some limitations in this research due to the time and costs as well as the research methods. Thus, future focus as a continuation of this research topic are suggested.

2. SPATIAL AND SOCIAL TRANSFORMATION OF URBAN NEIGHBOURHOODS IN CHINA

This chapter starts with a discussion on the definition of neighbourhood and its planning history. The review of the evolution history of Chinese neighbourhoods is another core part in this chapter, from which the current mixture of varied neighbourhoods and their characteristics can be understood and clarified. The past twenty years is a rapid modernisation and urbanisation period for China. Great spatial and social transformations have occurred in most Chinese cities, which have fundamentally created the new urban form and social structure. However, there has been increasing concern about the new neighbourhoods developed within this short period; they seem to be questionable under the criterion of social sustainability.

2.1 The concept, definition, and theories of 'neighbourhood'

Despite the importance of neighbourhoods in urban studies, there is no precise and uniform definition for the term at present (He and Wu, 2007). Most dictionaries would give more than three definitions for the similar terms 'neighbourhood' and 'community'. The two terms are interchangeable sometimes, but the latter is used more broadly in different research areas and has more varied meanings. For example, in ecology, a community is understood as 'a group of interdependent plants or animals growing or living together in natural conditions or occupying a specified habitat' (Oxford Dictionary Soanes and Stevenson, 2008). In social science, it mostly refers to a group of people living in the same place or having a particular characteristic in common. For urban studies, **neighbourhood** is preferable because of its longer history and higher focus on people being concentrated within a particular space. The Oxford Dictionary (Soanes and Stevenson, 2008) defines a neighbourhood as either 'a district or community within a town or city' or 'the area surrounding a particular place, person or object'. According to the Longman Dictionary (Fox, 2005), it is 'an the area around a particular place, or the people who live there'. The Collins

Dictionary (Hanks, 1986) additionally contains 'neighbourly feeling' in its explanations; thus, an aspect relating to people has been widely included in the discussion of neighbourhoods.

A review of important neighbourhood theories suggests a more comprehensive understanding of what a neighbourhood is based on the related planning history. In the 1920s, the 'neighbourhood unit' was developed by Clarence Perry in the US. Perry was strongly concerned about the walkability to nearby schools, and so defined a five-minute walking distance as a neighbourhood boundary. Its synthetic plan considering living, amenities and traffic together for a neighbourhood still frames today's urban development (Collison, 1954, Johnson, 2002). The 'new urbanism' which emerged from the 1990s advocated a new liveable neighbourhood pattern (Plaut and Boarnet, 2003). New neighbourhoods were proposed to be compact and pedestrian-friendly as an antidote to urban sprawl. The importance of mixed-use, diversity and people's quality of life inside neighbourhoods have been emphasised (Leccese and McCormick, 2000).

In China, the real idea of a neighbourhood with a full spatial-social meaning emerged after the 1980s when the country re-opened its door and became involved in worldwide knowledge exchange. A Chinese academic planning book introduced the idea that a 'neighbourhood' refers to a fixed geographical area with members of society who together live within this environmental and social norm, where inner functions and networks are generated (Li, 2000). The term 'urban community' has a special administrative meaning in China: it is the bottom level of urban governance (in the rural system it is the village), according to the national regime division[2], and a community office/station in a Chinese city can be responsible for the administration of a number of geographical neighbourhoods. A neighbourhood in China has a traditional spatial meaning and is generally regarded as a

[2] Overall, there are six levels of governance for urban and rural areas in China: nation, province/municipality, city/prefecture, district/county, street office/township, and community/village.

largely populated area with necessary amenities. However, a neighbourhood is also believed to be related to territorial boundary, social interaction and members' identification in recent studies (Wen et al., 2010, Zhou et al., 2013). Neighbourhood planning should be concerned not only with dwellings but also with people. In summary, an indication can be found from these previous discussions of neighbourhood worldwide: ideal urban neighbourhood development should have these key elements: 1 people; 2 geographical boundary; 3 social interaction; and 4 social identity.

2.2 The Evolution of Chinese Neighbourhoods

Asian cities have distinctive environmental and cultural characteristics; therefore, the results of investigating urban form highlight differences to urban research observed in a Western context (Cerin et al., 2013b). Analysis of Chinese planning and its prospects also has to consider historic conditions and motives of development (Abramson, 2006). A brief introduction to the evolutional history of Chinese neighbourhoods can clarify the current complex urban form precipitated by the urban transformation experienced in recent decades, which is now a great mixture of various types of neighbourhoods developed in different periods. In general, five types are commonly seen at present (Lu, 2006, Li et al., 2012): the traditional dwelling, work-unit, early commodity, new gated neighbourhood and urban village. Their spatial features and shaping processes vary completely.

2.2.1 Traditional dwellings before modernisation

A long story would have to be told if an introduction to the history of Chinese cites was to be presented in full. However, the origin of real modern Chinese planning and neighbourhood research started from the 1920s (Whitehand and Kai, 2006). Generally, the traditional neighbourhoods were created by local residents in their traditional ways before the founding of P.R. China in 1949. These neighbourhoods with their local architectural features were usually in a grouped pattern. The unique continuous arrangement of neighbourhoods in blocks usually retained the ancient Chinese planning of 'Li-Fang' (Chen and Romice, 2009). The building density was low and the inner spatial landscape was

abundant. A traditional neighbourhood was a peaceful and harmonious place where a big family comprising several generations could stay together for many years. There was little heterogeneity among residents. Frequent interactions took place with nearby neighbourhoods.

Figure 2.1 (a,b,c) Traditional neighbourhoods in Beijing (a), Shanghai(b) and Guangzhou (c)

(all photographed by the author)

Most of these neighbourhoods, which were shaped during hundreds years of inheriting cultural and social characteristics, have largely disappeared during the country's rapid socioeconomic transformation, except for a few which have now become rare heritage of cites. Specific examples include the 'hutong' in Beijing, 'lilong' in Shanghai or 'xiguan houses'

in Guangzhou (Figure 2.1). However, these protected by special conservations are only in a small proportion of what used to exist (Heath and Tang, 2010). A large number of more generic traditional neighbourhoods which gradually lost value are not protected by statutory plans in China. Now they have weaker connectivity with the massively transformed cities in which they are located. Most residents who still stay in these urban enclaves are either low-income workers, new migrants or laid-off citizens in great plights (Ying and Tipple, 2009). Because of its physical aging and disconnection with modern cities, in reality the infrastructure of a traditional neighbourhood has become intolerable based on today's criteria. Under the pressure of urban renewal, traditional neighbourhoods might be eventually replaced by new commodity neighbourhoods, or be changed into commercial, business or other usages, as local authorities find it very difficult and are unwilling to maintain or update these traditional neighbourhoods (Zhang and Fang, 2003).

2.2.2 The work-unit housing (Danwei) in the 'Mao era'

After the establishment of the new P.R. China and the implementation of the socialist regime, development of urban neighbourhoods was mostly undertaken through investments by local authorities or state-owned factory enterprises (Huang, 2004). A factory or local commune office had their own administrative rights to develop land by themselves, shape their own areas and provide accommodations for their workers (Hsing, 2010). A special community where people lived was called a 'Danwei', more explicitly in English, a 'work-unit'.

Large numbers of work-units were built since the 1950s in both urban and peripheral districts. This was the dominant urban form of Chinese cities during the Mao period under the special socialistic rule. In most neighbourhoods, factories, offices, hospitals and schools were all integrated within these units as a complete urban system. This system actually created a self-sufficient neighbourhood model, where workplace, accommodation and basic facilities were organised within a limited area, although it was usually at a larger scale than before (Lu, 2005). The monotonous appearance was common to see: the internal space of a

unit was almost neat and straight; its construction always adopted the multi-storey building type (3-6 floors), which was at a higher density than the previous traditional neighbourhoods (Figures 2.2, 2.3). Most of these units were walled and gated by clear administrative boundaries. Overall, there was little spatial differentiation among these neighbourhoods. The only difference lay in their investment and administrative bodies, by which work-units could be further subdivided, for example, an enterprise type, a university type or a civil servant type (Huang, 2004).

The work-unit also had a meaning of social identification. By 1978, about 95 percent of Chinese urban workers lived in this special type of neighbourhood (Hazelzet and Wissink, 2012). Inhabitants of a work-unit mainly comprised the unit's employees and their families. Thus, as people worked and lived together within this unit, their social interactions were very strong. Nevertheless, as people's activities were mostly constrained within an inner small society (their 'Danwei'), which was highly self-governed at that time, connections between different work-units were weak.

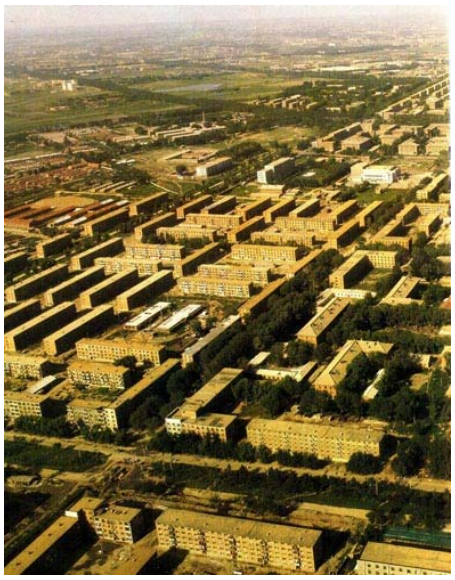

Figure 2.2 A typical work-unit in 1980s

Figure 2.3 The layout of Hepingli work-unit, Beijing

(Figure 2.2 from http://www.faw.com.cn/faw_online/news/zn60/ts60n/20090925095100016.htm;

Figure 2.3 from google satellite map)

2.2.3 The emergence of commodity neighbourhoods, early 1980s to late 1990s

In 1978, China boldly proposed a new 'open and reform' national policy, which switched its old central-planned system to a new market-oriented model, turning its focus to pursuing economic success. The model produced a high concentration on the urban economy; thus, the dispersed rural labour of the country was progressively shifted into cities. Under the tendency of urban expansion, functional zoning within urban areas became privileged in planning; residential areas, shopping streets, economic zones and university towns were clearly divided. A new type of urban neighbourhood, the 'residential quarter', was experimented with as an attempt at housing reform in the 1980s.

Residential quarters were implemented as an exploration of new planning policy with more concern for residential needs and the promotion of comfortable urban living. The growing housing industrialisation provided five standards for building new urban neighbourhoods: habitable, comfortable, safe, durable and economic (Li, 2013). The physical pattern of dwellings was mainly in the increasing multi-storey type (5-7 floors) with paralleled order and similar building distance. Public space was also increased, providing more recreational space for residents; however, there were no other functions inside this quarter. It can be seen that this design mode generated a new pure residential area inside cities (Figures 2.4, 2.5). Some neighbourhoods were created as national examples, and soon these profoundly influenced the urban form of other Chinese cities (Zhang, 1991). Emphasised by the reformed urban planning, this type of neighbourhood grew up quickly in many new cities and towns from the late 1980s (Zacharias and Tang, 2010). A special national planning guideline on residential quarters was later formulated using a hierarchical system.[3]

[3] The three-level hierarchy was defined as residential area (large), residential quarter (medium), and residential cluster (small).

Figure 2.4 A typical new residential quarter plan in the late 1980s

Figure 2.5 A residential quarter in Shanghai, built in the mid-1990s

(Figure 2.4 photographed by the author from SUPRC archives , Figure 2.5 photographed in Shanghai)

However, the experimental transformation actually resulted in a dual system involving both market and administrative mechanisms in housing development. As national reform was a gradual progress, urban neighbourhood development between the early 1980s and mid 1990s when the market economy was immature was not such a policy priority compared to today. In this early stage, the key focuses were on improving living qualities, especially in relation to physical indicators such as per capita living area (Ya et al., 2005). There were few changes in the inner social characteristic of neighbourhoods which was still similar to that in the work-unit period. In this era of residential quarters, a central allocation system for housing was similar to the old work-units. Inhabitants obtained a permission to stay from their unions or employers. Housing was still largely organised under a unified management and allocation system, not as a product for sale.

2.2.4 Great increase of new gated neighbourhoods, the late 1990s to today

The real influential urban housing reform took place in the late 1990s, which started the privatisation of public settlements. Local housing markets were set up with the establishment of a new market economy system throughout the country (Wang et al., 2005). In 1998, the national housing allocation system was terminated. This was also the formal end of the ‘work-unit’, which had existed for over 40 years in China. After the reform, most residents obtained their old properties by paying a little money through privileged offers

and social welfare policies. As housing became a real product circulating in the market from the late 1990s, the construction of new urban neighbourhoods from 2000 accelerated and moved forward faster than ever. A rising housing industry was created as well as the new role of 'real estate developer'. The new appearance, high quality and gated management were peculiar and attractive for many residents who wished to enjoy a desired modern life instead of the old-fashioned, traditional 'work-unit' accommodation. Intensively enchanted and actively promoted by developers, this newly created form of urban neighbourhood was seen to be an idealised living environment for modern China (Shen and Wu, 2012). The drive of the rapid development of new neighbourhoods was twofold. On the one hand, the reform of national fiscal and tax policy motivated local authorities to seek profits from urban land sale and real-estate development. On the other hand, it was also accelerated by the advanced building industry, technology and its mechanised mass production processes.

There was a huge transformation of urban form in Chinese cities during this period. In 2009, 97.19 million square metres of new commodity housing were constructed in Beijing (Beijing Municipal Bureau of Statistics, 2010), meanwhile 9.3 million square metres of dilapidated housing were demolished (Liu and Wong, 2015). The commoditisation of residential housing had been formally recognised and agreed throughout the whole nation. High-rise became the prevalent form instead of the multi-storey buildings, which was also the driven by housing investment profits under the new market orientation. Based around private production, Chinese urban neighbourhoods became more gated and walled (Figure 2.6). With the clear ownership of an estate, the boundary of a new neighbourhood was much more explicit than ever. The relationship of neighbourhood residents was also changed. In this transitional period, free-choice in where people choose to live began among city inhabitants. People living in the same neighbourhood had little idea of their neighbours from the very beginning (Hazelzet and Wissink, 2012, Forrest and Yip, 2007), which was totally different from the old colleague relationship inside the 'work-units'. The reduction of social interactions inside this new neighbourhood was noticeable, although the income level and social class of its residents seemed to be equal, which were usually linked with

housing price (Chen et al., 2011, Li and Zhu, 2014).

A new neighbourhood management system was also formed. As private property owners, all residents have direct powers and rights to formulate neighbourhood committee and hire professional agencies to provide management service. There may be some planning improvements as well. Learning from successful neighbourhood experiences, both domestically and abroad, neighbourhood planners after 2000 began to pay attention to environmental protection as well as humanistic concern in the design and construction processes. More diversified and mixed neighbourhoods have also been advocated to try and overcome disadvantages of the monotony of the new urban form and loss of social vitality (Figure 2.7).

Figure 2.6 A new gated neighbourhood in Shanghai, built in the early 2000s

Figure 2.7 A high-density neighbourhood with diversified inner forms in Shenzhen, built after 2006.

(both photographed by the author)

2.2.5 Special phenomenon under rapid urbanisation: isolated urban village

In recent years, there has been an increasing academic interest in special urban neighbourhoods phenomena worldwide, for instance, 'favelas' in Brazil, 'villas miseries' in Argentina, 'kampungs' in Indonesia (Zhu, 2013). The emergence of the urban village in China is epitomised by its unique socioeconomic context. Most of these settlements were

initially rural villages, but exaggeratedly sunk within the modern cities in the one-night-happened urban transformation. Surrounded by nearby newly-constructed sky towers, they have now become urban enclaves of Chinese cities, especially in mega regions and metropolitan areas like the Pearl-River Delta, led by the cities of Guangzhou and Shenzhen.

The growth of most urban villages was almost through a spontaneous process without any legal planning permission and guidance, as in this fast-moving urbanisation period less attention was paid to efficient spatial surveillance in China. Except for a few belonging to the original villagers, a great proportion of village buildings have no clear certificate of property ownership at all. Nevertheless, self-growth in these areas was even allowed by local administrative departments in a certain period. In the 1990s, an official clarification after Shenzhen's first master plan was released which required only a simple registration for many existing illegal constructions (Shenzhen, 1994), which could be seen as a special absolution policy. However, illegal development and intensification inside urban villages were still processed, chasing higher profits from enlarged lettings and potential higher compensations for future urban regeneration.

The exceedingly low building quality and extremely high urban density shaped the unusual landscape of urban villages (Figures 2.8, 2.9); chaotic textures and messy spaces are common to see inside an urban village where there is also a great lack of basic amenities and social welfare. Now planners often treat the urban village as informal housing and apply some special plans in reality (Hao et al., 2011). Although 'notorious' for their disorder and unruliness, urban villages still exist tenaciously in China with a rationale of providing livelihoods for indigenous landless villagers as well as less-expensive temporary shelters for urban migrants and low-income families (Shenjing et al., 2010). The constitution of their residents is complex: except for a few initial local farmers, most of them are floating populations from elsewhere in China with a high degree of instability. As the population inflows and outflows from urban villages are very common in many Chinese cities, gathering

exact census data for them is extremely difficult. There is also a great demographic heterogeneity, although internal interactions within a small homogeneous group may be occasionally found.

Figure 2.8 An urban village in Shenzhen

Figure 2.9 A map of urban village in Shenzhen

(Figure 2.8 by the author, Figure 2.9 from google satellite map)

Table 2.1 A list of the appeared Chinese neighbourhoods (or related settlements)

Type	Time	Spatial Character
Traditional neighbourhood	Before 1949	Distinctive with local cultural characteristics and abundant landscape; planned in 'Li-Fang', low density
Work-unit	1950s-1980s	Designed in similar order, especially in straight parallel layer; larger scale; higher density than traditional type, gated
Residential quarter	1980s-1997	Pattern similar to the 'Work-unit', smaller scale, single inter-function, increased density, semi-gated
Gated commodity	1997-today	Various layouts and landscapes; large or small scale both possible; mixed function; typically high-rise with increased high density; gated management
Urban Village	After 1980s	Radom and Disorder; self-growth and no-planning; high density

2.3 Current spatial characteristics of Chinese neighbourhoods

2.3.1 Urban expansion

Although modern urban planning had started, urban growth in China was particularly slow between the 1950s and 1980s (Qian, 2014), during which state policies on urban and rural development rose and fell in an unstable manner due to special political movements[4]. There was no huge gap between urban and rural areas at this time; the national inputs on industry and agriculture were almost equal. The real and unprecedented urban growth took place after the 1980s when industrial economic growth and urban agglomeration were greatly emphasised by the state. The proportion of urban population of China was less than 20 percent in 1978 (Song and Zhang, 2002), but is now approaching 45 percent, with 65 percent anticipated by 2030 (Yang et al., 2013).

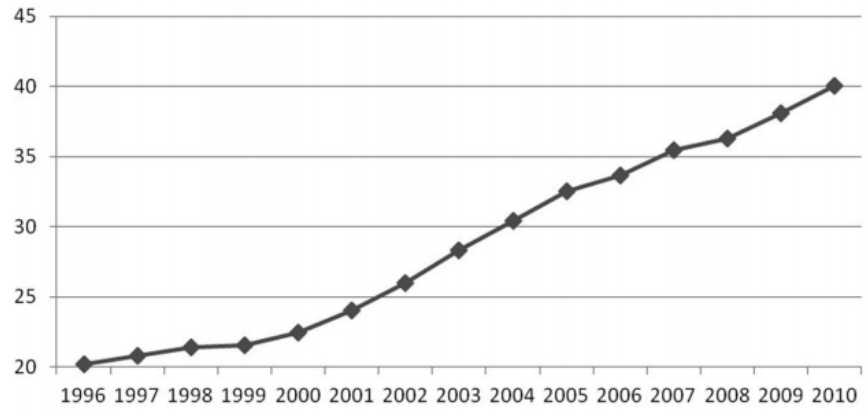

Figure 2.10 Built-up areas in Chinese Cities (1000 Sq. Km.), 1996–2010,

Resource from (Ye and Wu, 2014, p.3)

Hundreds of thousands of urban neighbourhoods have to be built to accommodate the largely increased urban population. The growth of housing constructions in many mega cities has been substantial (Figure 2.10) and the urban population has also increased remarkably. By 2010, 75 Chinese cities had a population of over one million (Ying, 2004b).

[4] There were remarkable political movements in the Mao Era, for example, 'Great leap forward' in 1958-1961; Cultural revolution in 1967-1976.

The population for the biggest cities such as Beijing, Shanghai, Guangzhou and Shenzhen is over 10 million. Rapid urban expansion has greatly encroached on the countryside. However, dualism between the urban and rural system exists. As noted, the new territories have not been effectively integrated into the existing, urban-based, planning system until recently (Chung, 2010).

2.3.2 The intensification of urban neighbourhoods

In China, a series of market-oriented reforms, such as administrative and fiscal decentralisation, land and housing reform, and profitable real-estate development are turning every Chinese city into a hotspot for real-estate development (Wu, 2012). However, reclaiming the importance of agriculture and drawing an essential bottom line of cultivated land resource, the state has generated more restrictions against the incoming tide of urban expansion. After 2010, demarcations on urban-rural boundaries and basic ecological lines have been implemented in many cities (You-tien, 2006, Xu and Chung, 2014), which has thus created an upper limit of available land for their future urban development. Under these constrained controls, urban neighbourhood development proceeds on a first-come-first-served basis. Worries about the shortages of residential land provision have started. Many neighbourhood sites are being offered at greatly increased local land prices, which largely raises the cost to developers. Residential developments in major Chinese cities have been gradually dominated by high-rise projects (Lu, 2005). Urban dwelling density and building density keep increasing as a result.

It can be seen that urban spatial intensification emerged under the combined effects of the drive of profit in the real-estate market and the scarcity of urban land. For new neighbourhood development and redevelopment, a compact high-density model is thus suggested as a policy priority (Peng, 2008). Advocated by many planners and estate developers, the prevailing ‘compact development’ idea sounds plausible in saving land and making urban intensification better organised.

2.3.3 Urban form phenomena: fragmentation and mixture

Completed within an incredibly short period, new neighbourhood development has been an extremely rapid process in China's recent history of urbanisation. However, this was not a pure elimination of the old built environment but a great mixture of all kinds of possibilities. Although the high-rise is the predominant form, there are still many old units and residential quarters in city centres. Extraordinary urban villages have also emerged in many mega cities as an unwanted legacy. The urban environment of many cities has become a great mixture of various neighbourhoods with different patterns (see Table 2.1, Figure 2.11), resulting in a fragmented landscape between the old and new, the urban and rural. The new gated community seems to be highly enclosed with less connectivity with other spaces. Facing all kinds of challenges, the environmental quality of old neighbourhoods declined quickly. As many different patterns of neighbourhoods are mixed within an area, the fast-shaped and disordered urban form has created new challenges for planners. Inequalities are also growing in the distribution and allocation of spatial resources and infrastructures (Sha et al., 2006).

The debate on urban form is ongoing, which not only exists within the context of spatial planning, but also extends to external social and cultural issues. Similar to the US, the urban development in China is now inclined to be privatised and enclosed, for example, the gated neighbourhoods and super shopping malls. Chinese society, which was highly unified and centralised in the past with strong social solidarity, has turned into a society with more localised, fragmented features. Land use has to be reclassified into many small pieces; for example, residential development now has to consider four different types of land use (R1, R2, R3, R4)[5], in which there are also many subdivisions. This results in the differentiation of land price and variation in urban regeneration policy; frequent applications for changing

[5] There are four main types of resident land use in China's planning system, details are in Section 3.2.1, Chapter 3

land functions and regulations are not unusual. Behind these is the drive of new 'land economy' from the local government and the chasing of urban development profits from private developers.

Figure 2.11 a, b The fragmented urban form and a great variety of urban neighbourhoods in Shenzhen

(Photographed by the author)

2.4 Social changes under substantial spatial transformation

The understanding of socio-spatial outcomes of new urban neighbourhood development in China has become a topic which is receiving more attention (He and Wu, 2007). Heikkila (2007) raised a question concerning how China's urbanisation has changed the fundamental character of Chinese society. According to Forrest and Yip (2007), examining social change from the perspective of urban neighbourhood is crucial but still insufficient in China.

Market forces in the globalised economy have led to an increase of social inequality in China in this rapid urbanisation process (Heikkila, 2007). There is a great distinction between the rich gated neighbourhood and the poor urban village, which inevitably causes increased re-gentrification of social classes. The middle-class is able to afford the high housing prices, which are still tending to grow at present. In contrast, genuine hardships and deprivation are found amongst low-income social groups, especially laid-off workers and rural migrants (He et al., 2010). This gap is extremely significant in top Chinese megacities such as Beijing and Shanghai (Li and Wu, 2010). Due to the lack of social connectivity, spatial integration of socially different groups appears to be difficult to achieve in the recent planning processes,

especially in many urban regeneration projects.

2.4.1 The uncertainty of liveability

Liveability is regarded as an essential component in Chinese culture (Zhang, 2007, Li and Guo, 2006). It may be true that new housing schemes have gradually improved the physical living environment. For most families, the general housing condition had a significate upgrade from the 1980s to 2000s (Li and Wang, 2013). However, in the process of neighbourhood development emphasising profit orientation, spatial elements for qualify of life may be sacrificed (Wang et al., 2012), such as public space and children's playgrounds. Wu and He (2005) indicated that people felt that their opportunities for social interaction, both in number and range, were decreasing with the disappearance of public places at the basic neighbourhood level. As current construction of the high-rise seems to be the favourite option, researchers have examined and proved that the high-density form would have a negative impact in reducing living space and generating a fear of overcrowding (Yang, 1999, Baldassare, 1982). There are also criticisms of its lack of high-quality public space and walkable environment for relaxation (Yuen and Yeh, 2011, Huang, 2006). Disparities are also found in the distribution of public facilities and provision of social welfare among different neighbourhoods (Lee and Chan, 2008, Edward, 2010). Uncertainty regarding the quality of life may become a new issue for future neighbourhood development. The profit-led development may need to be more controlled, because not enough emphasis is currently placed on the quality of life for neighbourhood residents (Geng, 2008).

2.4.2 The reshaping of social networks and neighbourhood sense

With the disappearance of the old social organisation by work-units, people are mostly connected by disciplines of market economy (Sun, 2004). One criticism of much of the literature is that the traditional neighbourhood structure has been demolished and informal social ties have been broken in the rapid urban development and residential displacement, although living conditions and urban infrastructure may have been improved (Wu and He, 2005, Liu and Wu, 2006, He and Wu, 2007). Forrest and Yip (2007, p.62) noted that 'weaker

and more fluid ties of association would indeed become more prevalent as Chinese cities are now becoming more commoditised'. With the new development of commodity housing, small social groups are shaped instead of the big social unions when a similar common value has been accepted, like sharing the same neighbourhood and social-class identity (Qian, 2014). According to some research (Zhu et al., 2012, Li et al., 2012), a property-based pride could still be found in these middle-class neighbourhoods and the community attachment may still exist. However, many studies have indicated that neighbour mutual contacts and social cohesion are becoming weaker in many new Chinese neighbourhoods (Miao, 2003, He and Wu, 2007, Xu, 2009). In addition and more importantly from the perspective of the entire society, the exclusion of underprivileged groups from basic services may occur, and there are also limited social contacts between different socioeconomic groups (Douglass et al., 2012, Zhou et al., 2015). Thus, the newly emerged urban neighbourhoods are now really questionable from many aspects of community social development.

2.4.3 Lack of effective governance

Critics appear to express disappointment with the emergence of social indifference to neighbourhood governance (Wu, 2002, Wang and Gu, 2002). For community development, it is importance to maintain trusts and norms of reciprocity among communities in terms of space and time (Bridger and Alter, 2006). However, in China's transitional process of developing new neighbourhoods, these have not been well established yet. The lack of concern for neighbourhood management is not uncommon, particularly with the increased mobility of housing choice and large number of migrants. Furthermore, as privatisation arises spontaneously under the form of gated communities, difficulty also lies in organising public involvement among different private neighbourhoods within one 'community office/station', the official unit of urban governance. Mutual collaboration among nearby neighbourhoods thus becomes weak. Meanwhile, residents may also feel that they have fewer channels to articulate their opinions via a guaranteed institutional approach. This could cause the failure of neighbourhood regeneration projects in practice (Zhang and Fang,

2003).

The unsuitability of this governance system has been repeatedly reported and highlighted by various studies (Gu et al., 2008, Wang and Gu, 2002). The bottom administrative unit of current urban governance, the 'community office', is not a physical neighbourhood but from many of their combinations. Thus the current governance system may not be able to organise stakeholders of different neighbourhoods efficiently. It is pointed out by Cheng (2012) that a bottom-up approach could be more effective at a micro-scale which empowers local collective decision-making and brings more benefits to local residents. The top-down mode, which is through delegated agencies or the immediate authority of the local state, however, rarely has the above considerations. It is thus suggested that the local authority changes its role from administrator to facilitator in the recent exploration of a series of national policy reforms (Cheng, 2012, Qian and Shenjing, 2012).

2.5 Discussions

2.5.1 A focus on new urban neighbourhoods

There may be pros and cons of delivering new commodity neighbourhoods, which paradoxically exhibit higher life satisfaction but weaker social networks (Li et al., 2012). By contrast, aging neighbourhoods have become urban enclaves facing the huge problem of being deprived of the chance of a better living condition, although they may still maintain a strong sense of belonging amongst many elderly residents. However, the drive for land redevelopment and embracing of new neighbourhoods seem to be irreversible in China (Friedmann, 2007) in respect to the great disappearance of old neighbourhoods in both the spatial pattern and social relationship. Thus, a great trade-off is necessary between the benefits of community social development and physical housing improvements in the decision-making process of urban development. There may have been claims on the fractured social ties and loss of sense of neighbourhood in Chinese cities in many existing studies, but rarely do we see a feasible proposal for rebuilding strong social networks for these newly shaped neighbourhoods. Regarding this significant gap in current research,

more attention needs to be paid to the pragmatic promotion of social sustainability for the current neighbourhoods and forthcoming developments.

2.5.2 Some abnormal patterns

A real neighbourhood should be a place with independent ability and inner common values. Independent ability thus requires satisfaction of basic needs; for example, most neighbourhoods need basic external amenities and convenient services to be located nearby, such as kindergartens and primary schools. At the same time, their inner common value is also important. A good neighbourhood will be shaped by a strong sense of belonging and pride amongst its residents, who can automatically think and claim they come from a named place under a common identity (Jiang, 2010). Following these criteria, certain types of urban settlements listed at the beginning of this chapter, such as urban villages, are identified as not having an effective 'urban neighbourhood'. It is often found that those urban villages, as special injections into the modern cities, do not have complete infrastructure. Kindergartens or primary schools as supports for basic needs are largely inadequate there, although their population density is normally very high. It is because the young people staying in these areas, on a temporary basis, do not need them, or are not able to access to them according to immigration policy[6]. Similarly, factory dormitories are special accommodations provided by enterprises or private sectors, which are usually found on the outskirts of large cities in China. However, these types of settlement are not treated as urban neighbourhoods as well, due to their incomplete functions in terms of liveability (no kitchen or common space). Here basic needs' supports are again weak for these young employees, who spend a lot of time in their enterprises. Moreover, there is no 'feeling of home' at all in these temporary accommodations. In summary, these phenomena are

[6] The national residence registration (hukou) policy (before the 2014 reform) did not recognise migrant populations as urban citizens, and thus did not provide equal educational recourses for them. The obtaining of urban resources was based on an effective 'hukou' (local household registration).

abnormal or exceptional under the suggested criteria of being an effective neighbourhood. External living supports and internal social development are both crucial to a meaningful neighbourhood. As a result, only certain types of development will be treated as eligible research objects in the next stage. Throughout the other chapters of this thesis, a 'neighbourhood' will then refer to a 'new Chinese urban neighbourhood' developed after the 1980s as a mature commodity housing type.

2.5.3 Debates on gated neighbourhoods

The emergence of gated neighbourhoods in China has produced broad criticisms. Gated communities appeared with popular embodiments of 'sealed residential quarter', 'walled feature' and 'enclosed management'. Research indicates that they produce social problems in jeopardising the sense of neighbourhood and increasing disengagement (Douglass et al., 2012). The assertion that gated neighbourhoods exacerbate social tensions and unsustainability is also made often. However, there are different voices justifying the gated form. Many residents still think that it is necessary to keep this form in order to produce a good living environment (Li et al., 2012). The solution of the gated form primarily serves as a security function for these neighbourhoods. Breitung (2012) showed that some residents even have a strong desire to separate 'insiders' from 'outsiders'. As gates and walls are acceptable in reality, Li et al. (2012, p.253) indicated that 'gating in and of itself is not a major factor' affecting neighbourhood attachment. The effects of gatedness may need to be further discussed at an upper level with more evidence regarding the macro socio-spatial changes. But recent studies have not given enough attention to the potential impacts of gated neighbourhoods on the integration of larger-scale spatial resources and the connectivity of local neighbourhood governances. Thus, judgement on the gated neighbourhoods has to be cautious and needs further exploration.

2.6 Conclusion

The development of new urban Chinese neighbourhoods is found by this research to be a special phenomenon that appeared during an exceptional transitional period. There was

also a great social change along with this prodigious spatial transformation. However, inadequate examinations have been made so far on whether neighbourhoods have been created sustainably in China, as many are now experiencing a period of disorientation. Regarding the great uncertainty and challenges that have emerged in terms of social sustainability, the shaping process of the new urban neighbourhoods needs to be deeply understood. As the outer character and inner shaping process of Chinese urban neighbourhoods are special, previous planning experiences and research findings in the Western context may not be fully applicable in China. The reviews of its unique planning system and planning process are indispensable, which will be addressed in Chapter 3.

3. NEIGHBOURHOOD RELATED PLANNING PROCESSES IN CHINA, VARIABLES AND PATTERNS

Linking the spatial changes and social challenges that were discussed in Chapter 1 and 2, a review of the urban planning system and governance system in China is necessary. The creation of an urban neighbourhood has a standard procedure inside a hierarchical system of planning and several key variables are fundamental determinants of the neighbourhood form. Using the two principle variables site scale and density, a theoretical classification of current neighbourhood patterns is made. Different patterns have raised wide concern in the literature, with great debates on their advantages and disadvantages in terms of the environmental, economic and social dimensions. The nexus between urban form and social sustainability in particular is discussed in this chapter. However, evidence suggests that inadequate consideration of social sustainability in China is becoming a great challenge for its planning system.

3.1 Urban Planning and Governance Systems in China

The Planning Act was promulgated by the state in the 1990s in order to guide and control urban development. The planning system is designed comprehensively and in an obvious top-down hierarchy: state-province, city-district, county-village. National planning guidance and specific standards are generated, as well as a hierarchy to supervise planning practices at lower levels. However, as much of this is general guidance, these national rules still empower most local planning systems to produce their local plans by themselves with considerable flexibility. Furthermore, as urban development is the present dominant drive and key focus, the really mature and powerful planning systems are found at the local city level (Tian and Shen, 2011). Despite the recent increase of non-statutory plans such as general or partial urban designs and special plans, adopting the statutory series is the typical approach in most Chinese cities. They tend to follow a standard planning procedure (Figure 3.1). In practice, a two-tier system is typical. It includes macro level strategical plans

and micro level detailed plans (Tian and Shen, 2011).

3.1.1 Macro-level strategical plans: master plans, district plans and land-use plans

A master plan in China has a specific goal to arrange the urban development comprehensively at the city scale for a designated period of time. This all-embracing work includes determining the size of a city, creating spatial and environmental strategies, making a reasonable use of urban land and coordinating all kinds of urban resources (Li, 2000). In practice, medium and large size cities must also prepare district plans (Tian and Shen, 2011). The district plan[7] plays a transitional role between the master plan and other detailed controlling plans, in order to arrange land, population, public facilities and utilities at the district level. Noticeably, these plans exist in many megacities such as Beijing and Shanghai, where the size of a district could be even larger than a medium Western city. For example, two large districts of Beijing, Haidian and Chaoyang, all have over 3 million urban population and an urban area of over 400 km^2 (Beijing Bureau of Statistics, 2010). Thus, district plans in these cities are actually an extension of the master plan to its subordinate administrative areas.

With neighbourhood development, some overall arrangements may be stated at this macro level. A chapter of the master plan may additionally introduce residential land strategies (He, 2007), such as the total increase in the volume of housing planned for the city. Master and district plans can also generate specific functional zonings for important new developing residential area, if applicable (Wu and Li, 2010). However at this stage, there are no direct, detailed plans for neighbourhoods or detailed elemental controls on projects. Hence, these plans are largely strategic and reviewing the micro-level planning for urban neighbourhood

[7] A district plan is often misunderstood and mistranslated as 'zoning plan' in China, actually they are not the same thing. In fact, a district plan is not only about the zoning on urban land use; it includes and elaborates on almost all the contents that are generated in a master plan.

development could be more meaningful for this particular research.

3.1.2 Micro-level controlling plans: regulatory plans, site plans and residential plans

A regulatory plan in China is a type of technical plan that determines the future shape of urban blocks and urban areas through detailed spatial controls. The land-use purpose of urban blocks is arranged at this stage. External and internal road networks are decided as well. In the meantime, controlling indexes are provided by local planning bureaus as key guidelines (Cao and Wong, 2006). The indexes include site boundaries, floor area ratio, built-up area, greening ratio and so on. Thus, a regulatory plan controls the main capacity and intensity of urban development through the inter-relationship between population and building densities. Although many of these indexes are mandatory and rigid, they could still be adjusted under certain circumstances with a special application (Wu and Li, 2010). Further guidelines such as partial urban design may be required as supplementary information for special sites, especially for the purposes of historic or landscape protection (Chen and Romice, 2009). However, these rarely occur in the process of normal neighbourhood development.

A detailed site plan is used to illustrate and understand the entire constructions, either existing or proposed (Wu and Li, 2010). When neighbourhood design proposals are submitted by designers and approved by local planning bureaus, a site plan will be made as a statutory plan inside the system. This will include the exact coordinates of each road, the actual layouts of buildings, the capacity of public amenities and the detailed design for public space and green space. Physical planning activities in China normally end at this stage. The actually planned contents and information will be published or opened to citizens. There used to be a three-level residential planning system in the 1990s which followed the previous ‘Soviet Union’ mode and divided the neighbourhood development into different

scales (Zhao and Zhao, 2003); the official documents[8] expressed some terms (residential area, residential quarter and residential cluster) that all related to the 'neighbourhood'. However, there have been infrequent uses of these terms in the current planning system which places an emphasis on integrated control (He et al., 2011). Urban blocks and plots now become key focuses instead, and regulations for neighbourhood development is mostly synchronized with the controls of urban blocks and plots.

3.1.3 Urban Governance

A four-level urban government system[9] has been widely implemented in Chinese cities since the 1990s. There is a clear administrative hierarchy 'City-District-Street-Community' in this system (Zhu, 2013). A district is a subdivision of a city area, and each district also have a branch of the local authority, constituted by the extended administrative bureaus from the city. It is common to see three or four districts in most Chinese cities. In traditional large municipalities such as Beijing or Shanghai, the number of districts could be over ten. But with the rapid urbanization, new megacities such as Shenzhen, also have a great increase in the number of their urban districts. A district can also be further subdivided into areas, where a 'street office' is the responsible administrative agency. Afterwards, several branches are dispatched by a street office to manage the smaller unit 'urban community'. Thus the community office, also named as 'community station', is the bottom unit of the local authority. In the 1990s, it was initially suggested by the National People's Congress (NPC) that a community office should be responsible for between 100 to 700 households (P.R.China, 1990). But the numbers with which it has to deal has been dramatically increased during one decade of rapid urbanization. In megacities like Beijing and Shenzhen,

[8] The Chinese urban residential planning and design code was made by Ministry of Construction in 1993 and revised in 2002 (the department is now called Ministry of Housing and Urban-rural Development)

[9] Beside urban governance, a three-tiered system is used for rural governance in China, which is in the hierarchy of 'county-town-village'.

now a community office managing over 3,000 households is not uncommon (Shenzhen, 2012a, Han and Gao, 2009). As a result, a re-evaluation of the capacity and ability to administrate communities to fulfill their intended functions seems to be urgently needed for both the central and local governments (Ying, 2004b). Furthermore, a 'two-skins' phenomenon has also been pointed out as an issue for neighbourhood development, as the administrative cells and planning units do not match (Ying, 2004a, Zhao and Zhao, 2003). The local planning system uses a large-scale basic unit for making regulatory plans, the size of which could be as large as a combination of multiple urban blocks. This is not equivalent to an urban community office which is usually smaller in local governance system, and the boundaries of the two systems are unmatched (A case will be introduced in Chapter 6). Hence, besides the potential impact from the existing urban and rural distinctions, spatial and social inequities may be accelerated as a result of the dual operation of the planning and governance in urban areas.

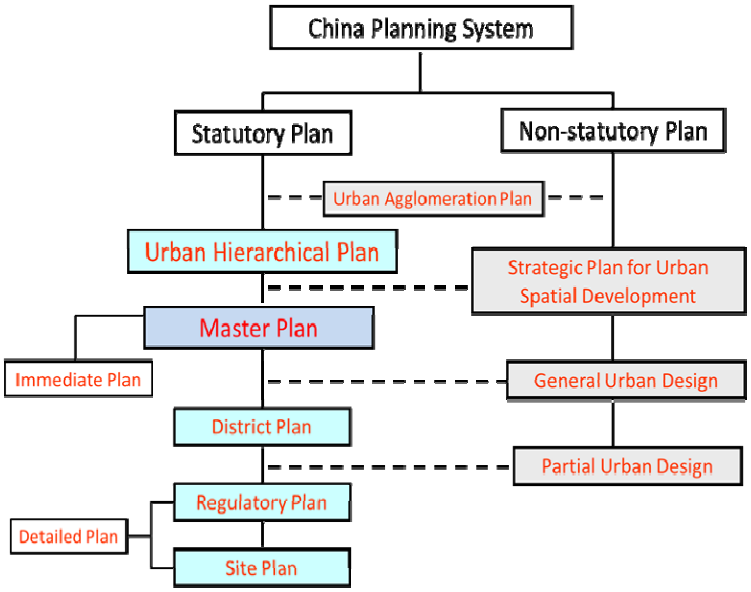

Figure 3.1 Urban planning system in China

(drawn by author)

3.2 The Shaping of Urban Form

Urban form has often been the main concern of urban planning and urban design, which is undoubtedly about the patterns of built environment created by humans themselves as a full result of regulation of urban or rural space. The creation of urban neighbourhoods is a

complex process in China. It passes through different series of plans and designs, from residential land plans to regulatory guidance, and is completed with the approval of the detailed site plans and neighbourhood design proposals. Different spatial elements of neighbourhoods are worked out at these different stages. Purposes and detailed types of development are ruled by land use plans. Key variables such as site scale and density have to be effectively controlled in regulatory planning. Other flexible and detailed arrangements are handled at the final design stage.

3.2.1 The type of residential land

Land use is the traditional planning focus in China (Li, 2000). Urban land is divided into 10 large categories, 43 medium categories and 73 small categories (Ministry of Construction, 2011). The residential land use (code R) is an important group among the ten large categories. There are four sub-groups in this category: R1,R2,R3 and R4 for residential use. R1 represents the low-rise high-quality residence with a decent environment. R2 is the generic housing type with supporting facilities. Among its various layouts and landscapes, the new high-rise gated neighbourhood is dominant at present within this group. R3 stands for the generic housing in lower conditions and may also sometimes include the dormitories built by factories and enterprises. Urban village and self-constructed temporary housing are all included in type R4. Thus, it can be seen that varied spatial patterns and land values exist behind these codes. Furthermore, each of the four groups still has further subsidiary classifications, such as R21 and R34, in order to represent detailed types of land uses inside each type of residential development. For example, in the group of R2, R21 is further coded as the net residential building land use excluding the greening area and utilities; meanwhile R34 solely represents the greening area inside the group of R3.

3.2.2 Regulatory planning guidance

The key focus of regulatory planning is on the controlling indexes of urban blocks and plots. The indexes include land-use balances, site boundaries, red-line restrictions, public service facilities, building density and coverage, greening and other technical indicators. All of them

must be properly calculated and meticulously formulated as compulsory regulations for projects (Wu and Li, 2010). The control of these indexes make sure that the public facilities and necessary infrastructures match and support the urban development. However, the imbalanced distribution of facilities and overloaded capacity have been great challenges for recent practice (Peng, 2008). As a result, frequent revisiting and revision of existing regulations has emerged as a common phenomenon. The change of indexes, although allowed under certain circumstance, is also required to be in a standard legal process in order to prevent unlawful operations (Pan, 2003).

3.2.3 Neighbourhood design proposal

Despite the above elaborate controls in regulatory planning, the detailed formulation of a neighbourhood proposal is carried out separately. The design proposal of a neighbourhood is usually made through cooperative work between professional designers and their clients, neighbourhood developers. The work of designers not only has to meet the restricted requirements from the upper planning regulations but also needs to satisfy the motivations and desires of estate investors. Undoubtedly, costs and profits are key determinants in the final proposal (Ren and Jin, 2011). An appropriate number of accommodation units and housing within built-up areas have to consider the interests of neighbourhood developers and their marketing demands (Zhao and Zhao, 2003). However, flexibility still exists in neighbourhood design. It applies to the layout, public space and greening space and is conducive to the diversity and unique characteristics of neighbourhood (Curtis and Punter, 2004, Rudlin and Falk, 2009).

3.2.4 Stakeholders and public participation

Although planning an urban neighbourhood in China passes many different stages, it seems that all these activities are finished internally. Although the planning and design involve some trade offs between the economic profit and the environment quality, social involvement including inhabitants remains largely ignored. In reality, the nature of a neighbourhood plan is top-down, and public participation is absent in the making and

implementation of plans (Tian and Shen, 2011). There may have been some improvements since the new era. Many new plans have been openly available at the planning bureau and online, so illegal or improper intervention could be effectively prevented during the broad public involvement. Furthermore, social enquiries have been treated more fairly at the local level (Shenzhen, 2012a). But many residents simply think it is the job and duty of the real estate developer to create a good neighbourhood for them (Zhang and Fang, 2003). Some, on the other hand, expect more for a fair and equitable neighbourhood development led by local planning bureau (Zhou, 2004). The lack of a social-oriented planning in China (Jiang and Lin, 2004) is associated with a fact that local social capital is not strong enough to implement a neighbourhood planning with a full public participation at the present (Qian and Niu, 2007, Zhou, 2004). It is also because many urban neighbourhoods are new and therefore no real participation could be started until they have been built.

3.3 The Key Variables of Urban Form

The urban form may be regarded as a product of urban planning and design (Bosselmann, 2008). The creation of urban form is traditionally through the key control of the shape and order of space as well as other factors like texture, material and colour (Francis, 1996), whereas the size and scale of space are often prerequisites for any conceptual analysis or practical intervention. However, so far there is no general definition given for urban form. The definition given by the UK government (Foresight, 2014) is that 'the physical characteristics that make up built-up areas, including the shape, size, density and configuration of settlements.' The 'General Plan Framework of Los Angeles' (2001) defines 'urban form' as (a) the 'general pattern of building height and development intensity' and (b) the 'structural elements' that define the city physically, such as natural features, transportation corridors open space, public facilities, as well as activity centres and focal elements'. It can be seen that many key elements such as size and density together shape the patterns of urban form. These elements are also usually the key control variables in the planning process and a special focus on their shaping process is therefore necessary. In China, the identification of these key variables has to be drawn from the review of the

current planning system, which has a clear hierarchy that generates different variables at different stages (Figure 3.2).

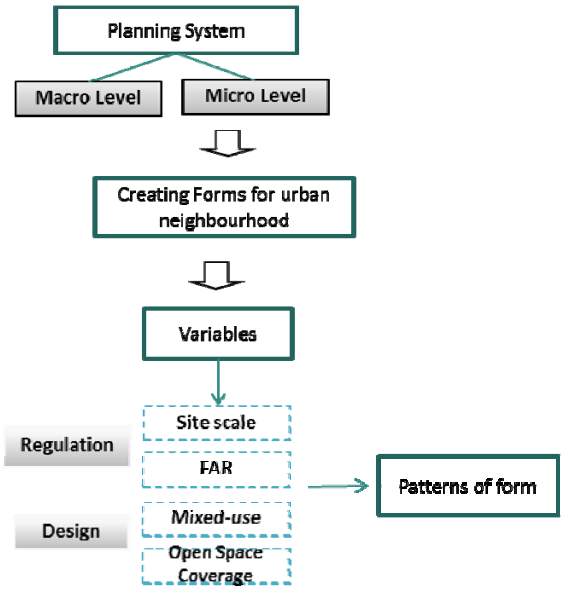

Figure 3.2 The shaping process of urban form from current planning procedure

(Drawn by the author)

3.3.1 Site Scale

Site scale (Ss), also understood as 'Plot Area' in planning practice, is identified as the first key variable that greatly influences the urban form in China. A reasonable division of urban land is important in urban development, as it affects land-use efficiency (Liang and Sun, 2000). The scale is also determined by transport plans. Transport planners suggest the idea distance between main roads should be between 600 to 1,200 meters (Wu and Li, 2010), and this has been regarded as one of the most important reference points for dividing urban blocks. However, other real factors, such as the natural boundary of a river, administrative boundary and special control lines may also need to be considered. Urban neighbourhood development can take place at the scales of large urban blocks and small urban plots (see Figure 3.3 as illustration), which means different site scales occur in planning practice. However, in reality there are some constraints. Developments using large urban blocks are usually rare in city's central areas. The splitting land into small pieces is common due to the high land value and extremely complicated urban context and property rights (Wu and Li, 2010). Thus, the type of gradual development of small sites seems to be

more popular for these areas. By contrast, large-scale development in the suburbs and within new towns is often feasible.

However, the variable site scale has not attracted attention from planners and designers in recent neighbourhood development, nor has it attracted much research attention. Twenty years ago when the regulatory planning system had not been sufficiently and systematically practiced in China, land division was random and subjective, even regarded simply as 'a way to place building' (Wu and Li, 2010). At the moment, neighbourhood site scale can be seen in most Chinese cities in a wide range between 0.3 ha and 20 ha. There is an irreversibility in the process of land use planning, and thus urban form is usually inalterable within a short period. This means the site scale in most built-up areas is often fixed. Regeneration projects usually have to be arranged based on their old sites unless a reconfiguration of nearby land is available. Thus, the site scale of central districts is often more restricted and smaller compared with the more flexibly controlled scale in suburb or new town developments.

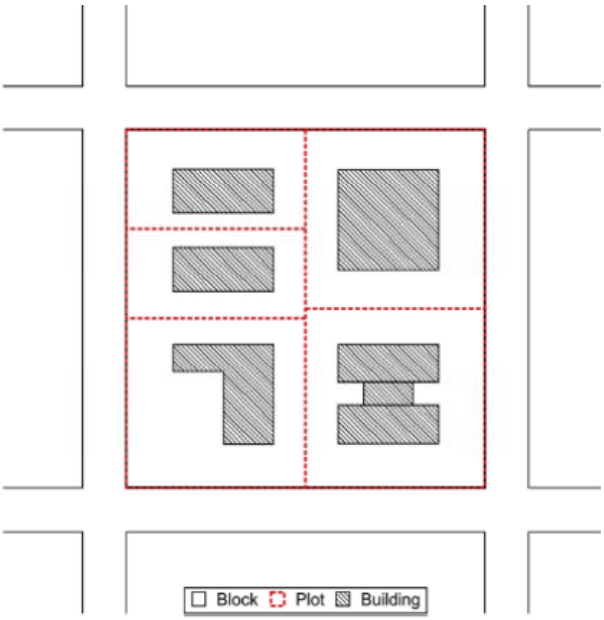

Figure 3.3 A schematic diagram for urban blocks (>10 ha), urban plots (1-2 ha)

Resource from (Shi and Yang, 2015, p.167)

3.3.2 Density

Mathematical developed to quantitatively describe a substance in a certain volume or certain area, density has been recognized as a key variable of urban space worldwide (Ian,

2008, Churchman, 1999). As a special factor of urban form, and frequently appearing in current planning policies, density refers to the number of persons, families or dwellings per unit of land (Albert, 2012). Its value can be explicitly calculated and compared for research purposes. In China, density is also a key controlling variable. However, density is often represented by a series of indicators in planning policies; it is thus necessary to clarify these different notions from the outset. Introduced by national planning policy (Ministry of Construction, 1993), density indexes can be divided into two main groups, density in term of people and density in term of buildings. The two groups are also mutually related. Among all these indexes, 'Floor Area Ratio' (FAR) and 'Population Density' (D_p) are the most important two in China (Deng and Wang, 1996).

The Floor Area Ratio (FAR), also named as 'Plot Ratio', is of highest importance in Chinese planning (Sun, 2009). It is calculated as a ratio of the total built-up floor area and the total site area. Thus, the FAR can represent the intensity of construction on a specific site. Recently it has been adopted as key an indicator of the urban built environment (Bao and Li, 2010). Population density (D_P) is another widely used index, not only in urban planning, but also in other social science subjects, such as demography. Its statistical value could represent the concentration of inhabitants, which is mainly counted by people/individuals per hectare or households per hectare in China. With different ways of calculating land use, the FAR an D_p could be both further divided into two categories, gross density and net density. Gross density includes road networks and green areas, facilities and all in other uses when calculating land areas. Net density considers the land that is in residential use only. But in general, the gross density is most widely used in the planning practices in China.

The current regulatory planning system has identified both of them as controlling variables. However, the FAR is one of 'mandatory' indices whilst population density is only considered as a 'guiding' index. This means in neighbourhood development, the FAR is a regulation with high restriction, any excess of the FAR should be ideally banned (Ministry of Construction, 1993). However, increase in the residential population may be acceptable, as

the Dp is not regulated so strict as the FAR. Furthermore, the FAR is relatively a more acceptable standard nationwide (Ministry of Construction, 1993). In fact, it can still indirectly reflect the intensity of population accumulation to some extent, as a linkage between FAR and Dp exists. Nowadays new housing development mostly takes similar average built area per unit (household) at about 30 m^2 per capita (Yao et al., 2014). In this case, the FAR can be calculated in a linear relationship[10] with population density and the ability to accommodate population for a neighbourhood can be identified from the level of FAR. So this research takes the FAR as the main density indicator.

3.3.3 Mixed use

Residential development in China used to be adhered to 'single use' before the recent 'mixed use' concept was encouraged by both research and practice (Kivell, 1998, Song and Knaap, 2004). Mixed-use, a well-known policy that was especially emphasised by the new urbanism movement from the 1990s (Calthorpe and Ryn, 1986), is now widely considered having a positive influence on neighbourhoods (Plaut and Boarnet, 2003, Song and Knaap, 2004). In China's actual situation, mixed use usually refers to one plot in which there are two or more kinds of functional use (Shi and Yang, 2015). According to some current planning practices (Municipality, 2013), the residential-use land (type R) is usually encouraged to have an appropriate mixed use with the type of commercial land (C), especially to combine the commodity residential land (R2) with the retail commercial land (C1). Thus, nearby amenities are often simultaneously planned and developed with the development of neighbourhoods as living supports. However, guidance for promoting mixed use is general and not rigid, which means that it has a degree of high flexibility in practice.

[10] FAR= $M_R \times P/Ss = M_R \times D_P$ P: total population (in households); $M_{R:}$ average built-up area per household. Thus, FAR and D_p is ideally in a linear relationship, as in practice M_R could be treated as almost equal to a constant (30 m^2/ household).

3.3.4 Building coverage ratio, Greening ratio and others

Building coverage ratio (BCR), also understood as 'building density' in Chinese, is another special control factor in planning regulations. Building coverage ratio is the proportion of total building base area compared with site area. Expressing the level of base coverage, the ratio is normally suggested to be around 20 percent to 40 percent (Yang and Chen, 2005). The current planning guidance and regulations also connects the variations of density (FAR) and building coverage ratio and building form together (Ministry of Construction, 1999). For example, 32% BCR would be the upper limit for a low-rise development (up to 6-storey) meanwhile its FAR value will be no more than 2. Thus, the real neighbourhood design could be limited by these combinations (Table 3.1). For example, if the FAR value needs to be over 3, only high-rise form can be used to achieve this, according to the national rule, and the constrain on BCR will also be suggested. Sometimes to reach an extremely high FAR that is over 5 or 6, due to the limitation of BCR, the developers will have to choose 20 or even 30-storey high-rise buildings as the solution, which will increase their costs. But in reality, the BCR is not controlled restrictedly and debates and bargains between developers and regulations could occur. The greening ratio, parking space ratio are usually used as supplementary factors. The greening ratio is compulsorily required to be over 30% in the newly developed districts meanwhile it still needs to be over 25% for the existing urban areas (Ministry of Construction, 1993). Parking space ratio is usually arranged with a high flexibility. Most of these variables are usually determined and provided in neighbourhood design proposals and finally approved by the planning regulation (Qin and Shao, 2012).

Table 3.1 Building type and storeys, Building Coverage Ratio (BCR) and Floor Area Ratio (FAR)

Building Form	Number of Storeys	Suggested Maximum BCR	Suggested Maximum FAR
Low-storey	1-3	43%	1.3
Multi-storey	4-6	32%	1.9
Mid-rise	7-9	30%	2.4
High-rise	≥10	22%	3.5

3.3.5 The Linkages between variables

There are several issues that need to be clarified considering the relationships between

variables and results of their combinations. In planning research and practice, terms are often used mistakenly and interchangeably. Firstly, the concept 'building form' is not equal to 'urban form'. The country classifies building forms into four types, low-storey, multi-storey, mid-rise and high-rise (Ministry of Construction, 1999). However, building form is only an outcome appears after construction. Scale, density and building coverage ratio are still invisible from a simple analysis of building form. Hence, the urban form is more complicated than the building form. For example, a 'high-rise' does not mean a 'high-density'. For neighbourhood development, very different levels of density could be achieved by the use of the high-rise model. For example, the results of high density (FAR=6), mid-density (FAR=3) and low density (FAR=1.5) are all possible with under a 24-storey high-rise development (Table 3.2). Thus, density cannot solely determine the pattern of urban form and the varied site scales can influence the final results. Secondly for a project, even if the scale and FAR are both fixed, the final appearance of form can still vary. For instance, a neighbourhood development of 3 hectares and FAR allocated as 1.8, three different forms could appear. 18-storey high-rise with 10% building coverage ratio, 9-storey mid-rise with 20% building coverage ratio, or 6-storey low-rise with 30% building coverage ratio (Table 3.2). This shows either the building coverage ratio, or the building height may still together affect the final form after the major effects of site scale and FAR. Generally speaking, the increase of building height would decrease the building coverage ratio in planning practice. But at present, it is unclear whether building coverage ratio determines building height or the opposite (Bao and Li, 2010).

Table 3.2 The variations of urban form

Building Form	**Site Scale (SS)**	**Density (FAR)**
High-rise mode	Large	Low (1.5)
High-rise mode	Medium	Medium (3)
High-rise mode	Small	High (6)
Density (FAR)	**Buiing Coverage Ratio (BCR)**	**Building Form**
Low (1.8)	10%	High-rise mode
Low (1.8)	20%	Mid-rise mode
Low (1.8)	30%	Low-storey mode

The relationships between variables can be found by further calculations and conversions of these variables using a series of formulas[11]. Thus, in theory, the variables site scale, FAR and building coverage ratio may also be mutually related. Although few studies have mentioned this interesting phenomenon (Pont and Haupt, 2007), in general, there is a lack of academic concern for the correct relationships between urban form, density and other factors. Hence, the urban form is not shaped in an univariate process, and any single variable cannot determine the final urban form. Debates on single variables may be one-sided and incomplete. The planning and design of urban form needs to take a comprehensive and stratified processes to handle these variables. Comparisons of urban forms should have a multivariable consideration and a correct combination of key variables.

3.4 Patterns of Neighbourhood Form

The development of urban space were summarised into patterns or modes by architects or planners (Christopher, 1977, Corbusier, 1971). That was also the main city-making approach throughout the thousand-years human history (Vitruvius, 1999, Morris, 1994). Regarding the great complexity of urban neighbourhoods and their potential stratification in terms of space, landscape, population and social structure, a typology is also a method widely implemented in current planning studies (Liu and Wu, 2006, Jabareen, 2006). Comparative studies mostly rely on the categories in which key elements could be essentially abstracted; the characteristics of each type should also be distinguished. Some categorizations for Chinese neighbourhoods exist in the literature. Wang (2005) classified them into three types by geographical location: urban, urban fringe (also known as urban-rural) and rural neighbourhoods. Another five-group classification was made by Zhao and Zhao (2003) according to the ownership and shaping of communities: traditional, allocated, commoditized, marginalised and mixed.

[11] $FAR=D_P \times M_R = BCR \times H$; $BCR = D_P \times M/H$ D_p: population density; M_R: average residential area per household; H:building height; M: total build-up areas

However, the use of typology has to follow its overall research aim and objectives. This study targets to explore the relationship between patterns of neighbourhood form and their levels of social sustainability. Despite the existed sociology-based discussions on neighbourhood categories, understanding the social outcome of Chinese neighbourhoods from its planning input is still greatly insufficient at the moment. More specifically, the Chinese regulatory planning system determines the practical development of urban neighbourhoods at present. The typology used in this research is original and special, which stands from a technical planning point of review. The classification of urban neighbourhoods is then based on the combination of the physical planning variables of site scale and FAR, the variations of which could fundamentally change a neighbourhood's pattern in practice. This classification also features a substantial understanding of neighbourhoods from their horizontal and vertical development results. In short, the typology method and the subsequent classification are unique because they focus on the shaping process of urban neighbourhoods. Chinese neighbourhoods can thus be further divided into several groups according to the two planning variables, site scale and density.

3.4.1 A theoretical classification

The first variable, site scale, is divided into the groups of large (>5ha), medium (1-5ha) and small (≤1ha), based according with some Chinese cities' statistical reports (Yang and Chen, 2005, Chen, 2012, Gu et al., 2008). The second key variable density could also be similarly classified into three groups; according to current urban density statistics and national standard (Chen et al., 2008, Ministry of Construction, 1993, Tang and Fu, 2003). They are low (FAR ≤1.9), medium (FAR 2.4-3.5) and high (FAR>3.5). Influenced by the level of urbanization in a local context, the range of each variable may be adjusted according to their actual land scale and FAR distributions. For example, the high density range would be increased for neighbourhoods in megacities like Beijing, Shanghai and Shenzhen. Nine big categories can be generated by this typology (Table 3.3). The full nine patterns are large-scale low-density (LSLD), large-scale medium-density (LSMD), large-scale high-density (LSHD), medium-scale low-density (MSLD), medium-scale medium-density (MSMD),

medium-scale high-density (MSHD), small-scale low-density (SSLD), small-scale medium-density (SSMD), and small-scale high-density (SSHD).

Table 3.3 A full theoretical classification of Chinese urban neighbourhoods

Scale / Density	Large (LS)	Medium(MS)	Small (SS)
Low (LD)	LSLD	MSLD	SSLD
Medium (MD)	LSMD	MSMD	SSMD
High (HD)	LSHD	MSHD	SSHD

3.4.2 Focuses on certain types of urban form

Specific focus are then given to certain groups in this classification. Many patterns of urban form, although existing in theory, do not appear very often in practice. For example, very few large sites are developed into a 'high density' form (LSHD) in China (Song, 2015). Large-scale low-density (LSLD) is also not the key focus of this study. This type is mainly in the form of the detached villa developed for upper-classes, and its percentage as a proportion of new build housing development is extremely low in China. In recent years, new low-density development has been tightly limited by the central and local governments, which has issued guidance against the extravagant provision of R1 residential land (Ministry of Construction, 2011). Furthermore, many other low-density neighbourhoods, which widely appear in old and central areas of cities, are usually associated with the form of multi-storey buildings with a longer history (see section 2.2 in Chapter 2). The medium-density and high-density development are more popular in Chinese cities. Thus, this research is more interested in some typical forms: such as SSHD, MSLD, MSMD, MSHD and LSMD in Table 3.3. For a full understanding of density's impact, a wide range comparison on density (from low to high) may need to be included, for example, patterns of the medium scale group could be explored in full.

3.5 The nexus between urban form and social sustainability

3.5.1 Socio-spatial interaction

Nowadays in the decision-making process, architects and planners cannot singly determine a city's future anymore. Good urban form is created by people and at the same time created *for* people. Thanks to the social planning trend that started in the 1960s, more and more citizens are getting involved in deciding their city's future through the planning process. The unique social perspective developed quickly as more planners thought about the urban form created by planning in term of its social impact, advocating a community revival trend throughout the world. The 'New Urbanism' wave in the 1990s proposed to improve a community's form by increasing inside mixed uses and designing a traditional neighbourhood structure (Leccese and McCormick, 2000, Plaut and Boarnet, 2003). Today it has been accepted that urban form has a potential relationship with a neighbourhood's social sustainability.

From the literature, the first link exists in social liverability. The design of urban form is a way to build the quality of the environment and thus have a great social influence on its residents' lives (Dempsey, 2008). According to Wan Mohd Rani et al. (2012), local planning authorities should ensure the good connection of residential neighbourhoods with local services and facilities, which indicated the importance of planning efficient public facilities in order to shape good social sustainability. Karuppannan and Sivam (2011, p.845) suggested that 'mixed use and good accessibility to the public realm and social infrastructure play an important role in increasing the social sustainability of the neighbourhood'. As discussed in section 3.3.3, land mixed use policy has been greatly encouraged in China's neighbourhood development process.

Another big point is the inhabitants of a neighbourhood will shape its character by activities and rituals, and integrate them into a socio-spatial recurrent pattern (Friedmann and Chen, 2009c). Urban form's impact on social interactions within communities is evident in the literature. For example, special designs for high-quality public realm and open space are

found to have positive contributions (Dave, 2009). It has also been confirmed that good urban form will increase a community's integration and cohesion (Rogers and Sukolratanametee, 2009). Thus, detailed planning and design solutions targeted for promoting social sustainability can be generated. However there might also be another reversed impact from human social activities, for instance, community involvement in urban design process can also enrich social networks with direct benefits for social capital and well-being and strengthen the quality of urban space (Semenza and March, 2009). Jabareen (2006) connected both the city and neighbourhood levels planning practices and indicated that there may be certain patterns that urban forms could follow to promote sustainability. According to him, the ideal sustainable urban form is that 'has a high density and adequate diversity, compact with mixed land uses' and 'liveable and community-oriented human environments' (Jabareen, 2006, p.48).

3.5.2 Debates on the sustainability of different urban form patterns

There have also been some related discussions about the sustainability of urban form in China (Yang and Chen, 2005, Wang and Yang, 2011, Ren and Jin, 2011). However, current discussions seem to be controversial and the previously introduced high-density development is a field of battle. However, this is often misled by the discussion of high-rise buildings. The upswing of the high-rise model has been suggested to be controversial (Zhang, 1988, Black, 2007). In terms of China's recent neighbourhood history, the multiple-storey is conventionally accepted with the virtues of a more comfortable family living and a better connected neighboring network (Jiang, 2004). As a result, the increasing of density and building height could be psychologically unwelcomed by residents. But in China, this model may not have direct and vital negative influence on neighbourhood sustainability. As indicated in section 3.4, a low building coverage ratio may appear as a result of an increase of building height, if it follows the suggested rule. Consequently, the relatively larger available open space may bring an increase in the availability of public space, playgrounds and green areas, which are thought to be also important for Chinese neighbourhood residents (Chen, 2003). This suggests some improving spaces for high-rise

neighbourhoods, which may overcome a potential defect, the physiological resistance among residents. Although inhabitants could be interested in the entire neighbourhood built environment; it is found that the majority still care more about the average residential area of their housing (Geng, 2008). Hence, without significant reducing the inner residential space, high-rise living is still acceptable for many residents. Zhang (2010) advocated the most suitable way is to adopt the 'high-rise low-density' or 'high-rise medium-density' modes for modern Chinese neighbourhoods[12]. It means high-rise could even be advocated by researchers and planners, if some necessary controls could be applied.

However, the high-density development which is common to be seen today is under a hot debate in China (Peng, 2008, Jiang and Ding, 2004). As discussed before, a high-rise model does not necessary means a high-density, but a high-density is usually received through an extremely intensified high-rise approach. Different from the high-rise mode's psychological conflict, the negative impacts of high-density are more tangible and socially meaningful and even could be directly linked with overcrowding or a decline in the quality of the local environment. A high density indeed is due to a large accumulation of population within an area, therefore, an overcrowding of space and a difficulty in using facilities can be strongly perceived. Together with the more frequent use of facilities, a higher pressure on facilities' maintenances is also apparent. A consequent inadequacy in local public amenities may also be caused by a nearby new higher-density development, as suggested by Geng (2008), because residents of Chinese neighbourhoods have to share these resources which are usually allocated for a larger urban area (urban block). This becomes serious under the current fragmented urban form, as a united plan integrating local facilities is often missing under split urban developments. Furthermore, a lack of social contacts has also been highlighted as a problem for both the Western and Chinese with high-density neighbourhoods (Zhang and Lawson, 2009, He and Wu, 2007). The same outcome appears

[12] Additionally in his point, 7-9 storey or 10-15 storey buildings were suggested as offering the best solutions.

in terms of the sense of community and social cohesion, although some residents wanted a greater opportunity for this to be facilitated (Bretherton and Pleace, 2008, Wang and Yang, 2011). In relation to neighbourhood governance, high density may also cause negative results by increasing safety and security issues (Baldassare, 1982). Thus towards social equity and sustainability, high-density development has to be more carefully considered.

However, does density itself cause these issues and is it the only variable worthy of a special concern? In planning practice, the increase of FAR in a neighbourhood development could often be a consequence of applying smaller site, as in reality small site development often results in the high-density pattern (Tang and Yiu, 2010). This is previously classified as the SSHD pattern, which is commonly observed in Chinese megacities and has become more prevalent after the 2000s (Tang and Fu, 2003). But it can now be considered as a typical pattern exhibiting many social problems. Its negative impacts have been suggested, for example, the scattered SSHD development in the city of Shenzhen has reduced the liverability inside neighbourhoods and also led to a deterioration in perceived quality of life in nearby neighbourhoods (Chen et al., 2000). Residents' poor accessibility to public facilities in single blocked buildings and small residential clusters has been identified by Chiu (2012) as other issues. Thus, the above density related issues can be combined with the issues of site scale for a synthesised discussion of the choices of typical urban form patterns.

For a large site development, for example, the LSMD pattern, it can also achieve a medium urban density. For individual neighbourhoods, larger inner green area and open space are likely benefits of this type of pattern. The disadvantages, however, may include the relatively longer walking/driving distance inside neighbourhoods, which may increase the commuting time of residents. Nevertheless, such a pattern is not very popular in practice, especially in central urban areas where providing available spaces for new neighbourhood development has become extremely difficult (LeGates, 2014). In pursuing a compact mode, the using of large-scale development may not be considered as an ideal solution by the local authority (Shen, 2007). The overloaded work expectations of current community offices for

managing large neighbourhoods is another real problem, as the number of households they are responsible for is often much more than an office's upper limit of 700 under the current governance requirements (Wang and Gu, 2002). The above discussion may indicate that the medium-scale development is, in theory, more acceptable as a balance between the small and large patterns. However, there is a lack of a clear statement from the literature and supporting evidence from empirical cases. And inside the medium-scale group there are still some different patterns of urban form, such as MSMD, MSHD and MSLD. But no research evidence exists to suggest which type of form would be more sustainable than others. The coefficient changes in building coverage ratio could also make changes to relative sustainability. In summary, the above discussions have exposed some potential benefits and disbenefits related to variations of the scale and density used in planning decisions. However, the real level of sustainability for many existing neighbourhood patterns is still vague at the moment.

3.6 Challenges for the current systems

From a macro view perspective, China's urban expansion and intensification are intrinsically driven by the state policy (Yu et al., 2014). The drive of the urban economy leads to the concentration of urban population, especially as the rural immigrants flock to the cities seeking more job opportunities. Although this situation cannot be completely changed by urban policy, a more comprehensive understanding of which models of urban form are more or less sustainable, especially understanding the compactness mode, is very important (Jabareen, 2006, Chen et al., 2008). At the city level, a more compact development with higher density is often regarded by local authorities as a plausible choice, which is determined by the limited urban land resource. However, there is an increasing worry about whether this compactness policy may have led to a super compactness and overcrowding (Peng, 2008, Geng, 2008). The direct increase of density delivered by planning seems to be an unconcern for social sustainability at least to a certain degree. Additionally, the decision-making processes requires a full consideration of economic, environmental and social sustainability together. However, it seems that social aspect has not been included in

the core process of neighbourhood development due to a typical top-down planning mode in China.

With China's state-lead top-down nature of urbanization, the evaluation of its planning policy objectives seems to be complicated (Tian and Shen, 2011). Urban planning system in every country is usually constrained by existing institutions and values and thus may not be always flexible (Abramson, 2006). So it is with China, and the planning system turns to be even rigid under great spatial and social change. The system currently focuses on enabling economic growth with greater emphasis on making functional, regulatory and detailed plans, but it is not powerful enough in terms of analytical, communicative, and advocacy roles (Abramson, 2006, Ma, 2004). Furthermore, sustainable development at the local level 'is not fully recognised' and 'planners have not been entrusted with a role as facilitators among stakeholders' (Ng, 2004, p.iv). What we see from the battle of urban form is a great trade-off among stakeholders internally and externally. Following economic criterion, which takes land saving as a key reference, a local authority will profit more from a very compact mode, and the small-site high-density mode will be the easiest way to maximize urban intensity in practice. For developers, density is also the key determinant for the patterns of urban form in their practice Roughly calculating costs and benefits, there will still be a great net profit for them in construction high-density neighbourhoods, even an advanced density ratio could degrade the estimated net 'rate of return' of investments by increased construction cost (Bao and Li, 2010). Another cost calculation is on the scale of development. Clearly, small-scale development is preferred by developers due to the easier capital turnover and faster economic benefits. Indeed very few developers will attempt a large development unless they have good a financial situation (Zhang and Fang, 2003). It seems that the constraint of large site development mode is the dual result of the developer's profit drive and authority's predicament in terms of land provision. Hence, opportunities and benefits to both the developer and local authority seem to coincide in terms of the choice of urban form. In practice, rules and regulations have been continually changed in local contexts (Pan, 2003), and many technical controls seem to become weak

and invalid in many recent urban neighbourhood projects (Chung, 2007). This analysis indicates the excess of urban density and fragmentation of urban land, which are not rare in local practice, both have a motivation of seeking higher profits. Thus, it is a great challenge for the planning regulation system. Whilst the major beneficiaries could be at the upper level of urban development, the inattention to the needs of inhabitants at the bottom level is a clear defect (Liu et al., 2012).

Furthermore, in the main body of the planning implementation, the planners and developers are usually in a relatively strong position by power and money. At present, their opinions can almost completely and unreservedly penetrate the whole planning processes. In contrast, the voices of individuals and communities have often been neglected due to their vulnerable positions. The expected choices of residents on the patterns of neighbourhoods have never been fully explored. According to the American urban renewal experience indicated by Jacobs (1961), urban development could easily make politicians and the real estate business gained, make planners and architects satisfied, but unfortunately often make all the ordinal people sacrificed. Thus, it will be a tragedy of planning if the social aspect of a neighbourhood is neglected, as it loses the correct orientation of the urban development. However, urban resources have to be carefully treated as a whole. Without an effective control system, wastage of land resources and consequent environmental problems could also occur (Ng, 2004, p.iv). A balanced option achieving a more sustainable urban form is greatly needed, yet insufficient at present. The assumed ideal density for neighbourhood development might be in a moderate range. This is because extra high-density generates overcrowding and social decline meanwhile low-density offers less efficiency in terms of the use of urban land (Yang et al., 2012). But for the real level of social sustainability, this assumption lacks direct supporting evidence.

There are more obstacles to achieving social sustainability in reality. A real problem for the planning mechanism lies in an approach to coordinate varied interests and work out an acceptable plan for all. This issue may be extended to the role of planning. Studies indicate

that current Chinese residential planning is a sole technical tool that draws 'dwelling space'; it needs to be transformed into a comprehensive approach that configures 'living place' (Friedmann and Chen, 2009a, Zhao and Zhao, 2002). In essence, city planning is an action that should be required to maintain public interest. It needs a system to gather information, compare requests and find out solutions through a more collaborative process. Thus, it requires planners to argue more for social justice (Burton, 2001). For neighbourhood development, the developer's actions are understandable, according to one human behavior model suggested by the rational choice theory (Howson, 2009), assuming people can be motivated by the possibility of making profits. But this is just one side of urban growth. Social development is also a requirement because of a human being's intrinsic value. A real advanced and sustainable planning system thus has to stand for a good balance. The excessive insistence on economic growth in urban development may be a mistake that have been made in China's recent urbanization (Sun, 2009), because economic growth has no right to undermine social development. Fundamentally, should the Chinese cities be created for cash or for people? This suggests the decision-making process should be eager to consider more about the social orientation and seeking a long-term sustainable pathway for future urban development.

3.7 Conclusion

This chapter has given a full explanation of the concept of urban form in China along with a special discussion of the neighbourhood shaping process. Emerging from the literature, there is a potential nexus between urban form and social sustainability. Certain patterns appear to be more socially sustainable in theory, but this cannot be confirmed until further studies are undertaken. Integrating social aspects in urban neighbourhood development might have occurred in China; but a gap is clear that such considerations have fallen behind the environmental and economic dimensions. To better apply socially sustainable criterion in practice, the special concern for its inclusion and indicators are necessary. This requires a clear framework and a feasible approach for assessing the social sustainability of Chinese neighbourhoods.

4. THE FRAMEWORK OF NEIGHBOURHOOD SOCIAL SUSTAINABILITY AND ITS INDICATORS

After reviewing the dramatic social transformations in urban China, this chapter aims to conceptualise a framework for assessing Chinese neighbourhoods under the social sustainability criterion. A literature review discusses its definition, inclusions and assessment approaches in both Western and Chinese contexts. The method of using an indicator system is suggested as being a suitable approach to undertake an urban sustainability appraisal. Establishing a clear and targeted framework is crucial so that social sustainability indicators can be effectively produced and widely applied across different neighbourhoods.

4.1 Neighbourhood Social Sustainability

4.1.1 A review of social sustainability in recent planning research

Undoubtedly as a complicated concept with rich connotations, social sustainability is difficult to define. In the current large volume of relevant literature, there is much discussion about its definition (Douvlou and Ryder, 2007, Vallance et al., 2011, Landorf, 2011). A comprehensive definition has been proposed by Barron and Gauntlett (2002, p.vi): 'Social sustainability occurs when formal and informal processes, systems, structures and relationships actively support the capacity of future generations to create healthy and liveable communities'. From a view of its shaping process, 'social sustainability is a life-enhancing condition within communities, and a process within neighbourhoods that can achieve that condition' (McKenzie, 2004, p.12).

Following the three-dimensional composition of what developed in Chapter 1, it is clear that a neighbourhood's sustainability should be achieved as a balance between environmental, economic and social aspects (McDonald, 1996, Roseland, 2000, Jones and Evans, 2008). Despite of an abundance of relevant studies (Bärsch, 2002, Eastaway and Støa,

2004, Rudlin and Falk, 2009, Jenks and Jones, 2010) as well as the proposed sustainable strategies (Roseland, 2000, Lapping, 2006, Brownill and Carpenter, 2009), the emergence of social issues in urban neighbourhoods has now become a real problem for planning (Page, 2000, Oliveira, 2012). For example, issues include social inequity and social exclusion in new growth area (Cuthill, 2010) as well as reduced social interactions and declined sense of neighbourhood in urban renewal projects (He and Wu, 2007). It is argued that the social aspirations should not be simply sacrificed for other perspectives such as the land economics or urban aesthetics (Roseland, 2000). The lack of consideration of social sustainability during the decision-making process may also be a fault of the planning system (Marcotullio, 2001, Newton, 2012). As a result, social sustainability needs to be promised by urban policy makers (Yiftachel and Hedgcock, 1993).

Promoting sustainable development seems to have been claimed by planning ideas and implemented in their practices. However, there is a great debate on the social outcomes produced by these strategies. For instance, the 'compact city' has been constantly questioned by social sustainability advocators (Jenks et al., 1996, Burton, 2000, Peng, 2008). For example, high density could cause emotional stress and other negative psychological conditions (Neuman, 2005). Social-oriented plans (Friedmann and Chen, 2009b, Cuthill, 2010) are also proposed towards the pursuit of quality of life and social justice. In summary, social sustainability is an increasing concern from both a theoretical perspective and practically in terms of how it can be operationalised or facilitated. Although acknowledging delivery difficulties in recent urban development, social sustainability is still an indisputable common goal for all researchers and planners.

4.1.2 The inclusions of neighbourhood social sustainability

There is a considerable amount of interdisciplinary studies on this topic (Dempsey et al., 2011, Magee et al., 2012, Ghahramanpouri et al., 2013). Current research (Colantonio, 2010) has attempted to identify its key principles and components for the grand concept of social sustainability. From the rich literature, an important agreement is that human beings should

be the constant focus for social sustainability. Basic infrastructure, residents perceptions of quality of life, residents sense of their neighbourhoods, social interaction and the whole operation of community are all listed as essential elements of neighbourhood social sustainability (Dempsey et al., 2011, Karuppannan and Sivam, 2011, Magee et al., 2012, Landorf, 2011). For individual social lives, relevant research mainly focuses on quality of life, access to facilities, and possession of public space. Social interaction, social cohesion as well as neighbourhood stability and safety are commonly seen in the discussions of neighbourhood social development. Dempsey et al. (2011) regard the individual quality of life and the function of the whole community as the two core parts of social sustainability. Micro individual perspective mostly follows a 'basic need theory' and takes residents as the main object (Woodcraft et al., 2011). Quality of life, often tested by subject satisfaction, is commonly seen in this type of social sustainability studies. The relations and interaction of inhabitants are also discussed under this perpective. On the other side, infrastructure and amenities, social equity and justice, safety control and crime prevention are common contents from the macro perspective research, which inclines to consider a community as a whole (Davidson, 2010). From this discussion, the emergence of a clearer neighbourhood social sustainability framework is not far away.

In China, now social sustainability cannot be ignored, considering the recent tendency of national social reform and an increasing concern with regards to quality of life and social equity in the new era. Although less discussed than Western researchers, more discussion has recently appeared (Jin and Zhu, 2011, Ying, 2004a), which contributes to social sustainability through localised explanations in the Chinese context. According to Jin and Zhu (2011), a social sustainable neighbourhood should have both external and internal considerations. Four aspects are highlighted by them: physical designs of community which includes architectural feature, space texture and environmental atmosphere; the social organization and management of the community; customs, habits and social interaction of the residents; and the value orientation of community, such as the sense of community and humanistic spirit.

It can be argued that concerns have been gradually shifted from high-quality physical environment to public service and neighbourhood management. A wide public participation in the planning process is also advocated by studies (Friedmann and Chen, 2009b). Self-organization and self-growth are also emphasised (Ying, 2004a), which should also be based on the powerful social capital of a community. Zhang (2000) indicated that community development around the year 2000 was feeble and futile in China considering the profit-led orientation in the real estate market. The main focus of the planning system was only the physical environment of neighbourhoods. According to his study, community development should establish high-level standards rather than simply basic satisfaction with supportive facilities. More considerations need to be given to social justice, social capital, territorial sense; public participation should be encouraged in all these activities with planning activities focused on higher, long-term goals. The aim of developing neighbourhood social sustainability, according to Yu (2005), is: to improve life satisfaction; to promote social interactions and establish social network; to build up distinctive local characteristics; to create specific social; and environmental factors; and to promote functional and social integration within community space. Different layers of a neighbourhood's organisation aslo need to be considered. Yang (2004) divided it into three levels, individual capital at a microscopic level; organisational capital at a medium level, and finally, social capital at the macro level. This shows the social constitution of a community and implies the inclusion of social sustainability may be drawn in a layered structure with pespectives from an individual, their internal networks and the cohesiveness of the community as a whole.

From the above discussion, Western and Chinese social sustainability concepts have in essence similar components, despite a few differences from the varied local neighbourhood contexts. Consequently, core and common elements of a socially sustainable neighbourhood can be summarised. The individual quality of life in neighbourhoods and its physical environment must be always included. The relationships between inhabitants could

collectively shape neighbourhood social ties and networks. For upper development, public participation (either active or passive) as well as the stewardship and governance are important. To be clearer, a socially sustainable community should be equitable, diverse, connected and democratic and aiming to provide a good quality of life for all.

4.2 Assessing social sustainability

4.2.1 A review of current sustainability assessments and their methodologies

The research trend attempting to link the social outcome with the planning input using social sustainability assessment seems to be new (Colantonio, 2008, Bramley et al., 2009, Berkeley, 2012). However, its prototype 'sustainability assessment' has already existed for over 20 years, has generated a considerable number of research papers with different research methodologies. Some studies (Devuyst, 1999, Pope et al., 2004, AlWaer et al., 2008, Sharifi and Murayama, 2013) have compared current research methodologies and revealed several patterns of urban sustainability assessment. There are different preferences in different disciplines. For example, economists are inclined to apply a 'monetary aggregation' method, whereas the adoption of an 'indicator system' is more popular in social science (Rajesh Kumar et al., 2009). Furthermore, the assessments may appear to be diverse considering their conceptual origins, driving forces and involved stakeholders. The different pathways may also depend on a 'top-down' or a 'bottom-up' perspective adopted by the assessment.

4.2.2 The indicator system as a key method for assessing social sustainability

The 'indicator system' is suggested to be the most widely adopted method that is especially effective for sustainability assessment at the present (Wang, 2010). In general, it constructs a distinctive system following the general idea of sustainable development and realises the entire assessment through reasonable indicators with good calculability and comparability (Bell and Morse, 2008). A list of indexes is used by the indicator system to compress the comprehensive idea of sustainability into certain perspectives, from which final results representing the level of sustainability are also clearly visible. The indicators are usually

quantitatively designed, and the system should have a specific focus for a certain period or on a certain area. Besides the wide acceptance as a fundamental theoretical work, the sustainability indicator system is also deemed as a practical platform to estimate, analyse, monitor, evaluate and predict the status of urban development (Hemphill et al., 2004a). Additionally, they could also establish certain criterion as special guidance for public behaviours and neighbourhood activities under the principles of sustainable development (Bertone et al., 2006). However, it is also illustrated that there have never been any 'one size fits all' indicator system applicable for the complex environments in different countries and cities (Colantonio, 2010). Despite this, more and more indicator systems have been designed and implemented, especially in the Western urban context.

4.2.3 A Review of current typical sustainability indicator systems

First developed in 1993, 'Sustainable Seattle' is now a mature product in the US. As a sustainable assessment applied at the city level. It has five key components and a series of forty indices representing environment, population & resources, economy, youth & education and health & community (Holden, 2006). The selection and re-selection of these indicators are through a long-term dynamic process with successful public participations and a continued monitoring of results. Led by the clear goal from the leader team, the assessment initially came from elite experiences; however, public engagement later accumulated a series of continuous feedbacks from practice, which greatly contributes to its success. Recently assessments similar to the 'Sustainable Seattle' model have multiplied (Koichiro and Aris, 2012, Vehbi and Hoşkara, 2009, Gallego, 2006). This trend has also been extended globally with more Asian countries and cities involved (Huang et al., 1998, Lee and Huang, 2007). Despite its achieved success and wide acceptance, it is an empirical plan implemented under a designed goal for the Seattle region only reflecting local characteristics. The complicated mammoth work of Seattle's goal-oriented action may be too difficult to be rebuilt by any research. In contrast, other assessment models with a 'theory-oriented' purpose seem to be more popular in recent research activities (Pope et al., 2004, Valdes-Vasquez, 2011).

In 2005, the city of Vancouver enacted a social development plan for the whole city and introduced an ad hoc social sustainability framework (City of Vancouver, 2005). Its overarching principles included equity, inclusion, adaptability and security, which were further divided into several sub-themes with certain ranges from 'living' to 'moving'. This indicator system is a typical 'bottom-up' model deduced from the 'basic needs theory'. Fully accounting the essential daily activities of residents, the system was developed from an individual perspective, especially emphasising 'quality of life' largely. However, due to the lack of indicators considering neighbourhood as a whole, higher-level social sustainable development perspectives are not included in this framework.

Woodcraft et al. (2011) introduced a UK-based social sustainability framework, another typical 'top-down' model with a special long-term consideration of neighbourhood social development. Its four components of social sustainability were: amenities and social infrastructure; social and cultural life; voice and influence; and space to grow. The overall structure of this elaborate 'indicator system' has almost covered all the important social aspects of a community along with a strong logical consideration of a community's shaping process. The four components include both physical and non-physical indicators, which are strongly linked. However, some indices within this framework were not clear enough and could have been more integrated, such as inter-relationship between community assets and infrastructure. A more concise and convenient indicator system could have been established. Furthermore, accurate measurements in practice may be difficult for some indices, for example, the voice and influence of some neighbourhoods. Nevertheless, the new structured framework is constructive and has a great contribution to the systematic assessment of neighbourhood social sustainability.

The emerge of social sustainability assessment in China is relatively new, but recent progress has been made. Some Chinese scholars (Zhao and Zhao, 2002) claimed that indicators for the physical environment improvement should be given a priority in order to

emphsis the basic needs satisfaction. Xuan (2002) suggested indicators for a socially sustainable community to be structured in a logical order: improving the living quality and satisfying various demands of community residents; advocating mutual cooperation and promoting self-reliance to solve community problems; cultivating democratic consciousness and encouraging residents to participate in community affairs initially and proactively; strengthening the local community integration and, finally, contributing to the social reform and transformation. This 'dynamic process' perspective can be seen as a useful way in establishing an indicator system designed to meet the long-term development needs of communities in China.

In summary, it is argued that a synthesis of bottom-up and top-down approaches is necessary in a social sustainability assessment. However, a gap seems to appear in terms of researching scales. Currently existing sustainable assessments are mostly implemented at the city-level. The focus on the level of a neighbourhood, the basic cell of cities, with a unique social perspective, is still inadequately addressed at the moment.

4.3 Assessing the Social Sustainability of Chinese Urban Neighbourhoods: Developing A New Framework

4.3.1 A reconstruction of social sustainability framework

From the above discussion, differences still exist in representing the structure of social sustainability under diverse urban and social contexts and varied research logics and designs. Although there are a large number of social sustainability models at the present line, the adoption of a new targeted assessment framework for Chinese urban neighbourhoods is still essential. Filled with unrelated measurements, many systems lack effective logic linkages between indicators or have inadequate consideration of the ultimate goal of neighbourhood sustainability (Pope et al., 2004). An understanding of social sustainability should give more attention to the behaviour characteristics and lifestyle of residents as well as their inner bonds shaped by common culture and values, and the entire operation of their communities (Landorf, 2011). A systematic reconceptualization of

neighbourhood social sustainability should be developed through identifying the fundamental organisation of neighbourhoods, stratifying the inclusion of social sustainability, so that roles and meanings can be clearly explained. This could overcome the obstacles of unavoidable disagreements and distinctions within and between many local communities. To conclude, a systematic reconstruction of the ensemble structure of social sustainability is crucial for assessing Chinese urban neighbourhood should be seen as a priority.

Gehl (2010, p.33) suggested that 'the natural starting point for the work of designing cities for people is human mobility and the human senses because they provide the biological basis for activities, behaviour and communication in city space'. No matter how the frameworks of social sustainability vary, 'people' will always be its undisputed and consistent concern. Hence, neighbourhood social sustainability should keep focusing on human beings themselves. This research develops a new framework under a new three-layered perspective (Figure 4.1): from individual to their dispersive activities and finally to the whole community. To be more accurate, this conceptualization develops the exploration of residents' individual basic needs as its first layer; a following consideration of the mutual bonds of residents generates the second layer 'social networks'; a final review of the whole operation of 'community development' makes the third layer.

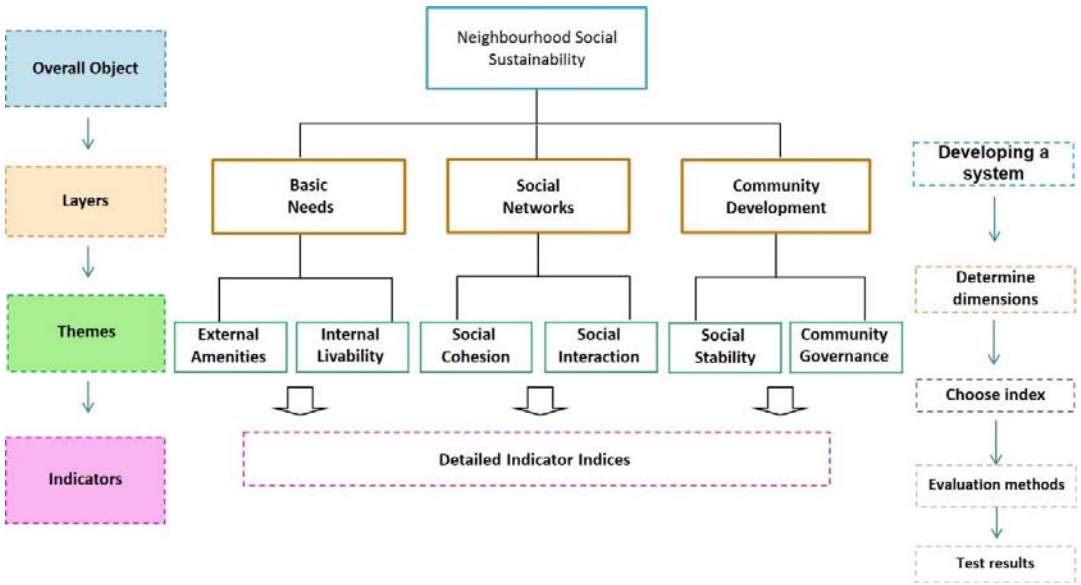

Figure 4.1 The framework of neighbourhood social sustainability and the process of developing indicators

4.3.2 The layer of 'Basic Needs'

The content of 'Basic needs' is identified by this research as the first layer of neighbourhood social sustainability, the importance of which has been widely suggested by researchers (Lagos, 1992, NGO, 2002, Chan and Lee, 2008). It is informed by the 'bottom-up' models (Holden, 2012b, Colantonio, 2010) where there is an emphasis on 'quality of life' (Davidson, 2010, Landorf, 2011, Bramley et al., 2007, Dempsey et al., 2012b). Despite the great variety of individual needs in daily life, shaping a great place with decent liveability for people is always a key concern of planning. Thus, the individual needs could be specially interpreted as the requirements on certain necessary living amenities and facilities, either internal or external. This has also been indicated by the Chinese planning policy (Ministry of Construction, 1993). This layer can be divided into two parts.

External Amenities greatly contribute to liveability and sustainability. It is identified as the first key theme of 'basic needs'. Sirgy et al. (2006) suggested that people living in a place with more supporting amenities are likely to be happier with their lives than those with less. A strong association of individual well-being (Besser et al., 2012) with neighbourhood amenities have been highlighted by recent social sustainability studies (Dempsey et al., 2011, Berkeley, 2012). Munro (2009, p.189) indicated 'the equitable provision of community facilities has been identified locally and internationally as an important component of sustainable development'. Its role is also long-term in 'providing services and facilities that meet the needs of residents, promoting social interaction and enhancing overall quality of life are vital to building sustainable communities' (Brown and Barber, 2012, p.99). In summary, external amenities need a special consideration at the very beginning of any social sustainability assessment.

Internal Liveability is commonly seen in social sustainability frameworks with the quality of a neighbourhood's inner environment being suggested as being very significant (Dempsey et al., 2011, Berkeley, 2012, Woodcraft et al., 2011). From an individual perspective, as leisure is a part of daily life, creating liveable physical surroundings inside neighbourhoods

will provide more leisure and recreation opportunities for residents (Johnson and Backman, 2010). For housing projects, internal liveability not only meets the basic leisure needs of residents but also contributes to providing civic connections and inspiring social activities (Walljasper, 2005). More specifically, the role of public space has been greatly emphasised by Western research (Semenza and March, 2009). It has great potential in shaping cultural identity and sense of place (Giddings et al., 2011). As discussed in Chapter 2, the dominated type of neighbourhood China has become a 'gated' one. Consequently, the role of inner public space for a Chinese neighbourhood can be thought of as being even more crucial (Xu, 2009). Neighbourhood public space arouses all kinds of daily social activities (Liu and He, 2007) and should always be a key element of liveability (Zhang and Lawson, 2009, Bunnell, 2008) . Together, neighbourhood internal liveability should be treated as important as external amenities. In practice, it is also required by the Chinese planning and design guidelines (Ministry of Construction, 1993).

4.3.3 The layer of 'Social Networks'

As a multi-dimensional concept, social networks can be conceptualised as the social glue that enables people, communities and nations to work collaboratively for mutual benefit (Putnam 2000). Sociologists recognise these mutual relations as a strong power of 'social capital' (Yang, 2004, Miller and Buys, 2008). Thus, individuals and neighbourhoods can both gain from developing their inner social networks via social engagement, mutual assistance and trust (Currie and Stanley, 2008). Recent interdisciplinary research identifies social network as an important dimension of community social sustainability (Colantonio, 2008), which is a 'supportive' component including observable social interactions, psychological sense of community and organic social cohesiveness (Rogers and Sukolratanametee, 2009). Overall, these studies highlight the need for developing the social connectedness of neighbourhoods. The social network of a neighbourhood is shaped through a gradual process, in which individual needs have to be satisfied, and common values have to be shared by members. Hence, it is mostly accessible through an understanding of social interaction and social cohesion, where reciprocity, norms and mutual trust are the key

perspectives (Kleinhans et al., 2007).

The significance of **social cohesion** for a community/neighbourhood has been highlighted by many studies (Liu and He, 2007, Li, 2008, Wood et al., 2010, McMillan and Chavis, 1986). Both a virtual community or a geographical neighbourhood need identification and cohesion among members (Cheung and Lee, 2009, Dagmar et al., 2011), as decent community characteristics can hardly be generated without social cohesion (Rogers and Sukolratanametee, 2009). Although the definition is still unclear, social cohesion is often understood as 'something that glues us together'(Rajulton et al., 2007, p.462). A definition by Rosell (1995, p.78) explained social cohesion as involved 'building shared values and communities of interpretation, reducing disparities in wealth and income, and generally enabling people to have a sense that they are engaged in a common enterprise, facing shared challenges and that they are members of the same community.' Generating positive social tie that gives group members access to privilege, resources and psychological support, social cohesion has been widely regarded as an essential component of social sustainability (Dempsey, 2008, Cuthill, 2010, Morrison, 2003).

Recently there is a considerable academic interest in exploring the **social interaction** of neighbourhood inhabitants. Social interaction represents the residents' daily activities inside the neighbourhood as well as their relationships with others (Stauskis and Eckardt, 2011). The role of social interaction is postively indicated as 'can generate a variety of local resources that residents can individually and collectively draw on for practical and emotional support' (du Toit et al., 2007, p.1679). Closely linked with the first layer of 'basic needs', social interaction is also suggested as improving individual satisfaction as well. This is not only from the benefits of physical activities, but also from psychological and social effects, for example, 'compensating for negative events in later life, such as loss of spouse and friends' and 'decreasing the feelings of hopelessness'(Sugiyama and Thompson, 2007, p.1945). Thus, neighbourhood planning needs to 'humanise urban environments physically and socially, making them conducive to social interactions and well-being'(Semenza and

March, 2009, p.27). As a result, social interaction is a core theme that needs to be assessed in the discussion of social networks.

4.3.4 The layer of Community Development

Community development is regarded as the final layer of this social sustainability framework. Research often treats a community as a whole and discusses its overall development as an essential, inherent issue (Lloyd, 2002, Xuan, 2002, Lubove, 1965). In this study, the general characteristic of community development is firstly represented by social stability, which is usually described by its demographic or statistical features in terms of residents mobility and neighbourhood safety. Secondly, the governance of communities are also essential, as grass-roots based community development is just a necessary pathway toward social sustainability (Rogers, 2005, Farrah, 2006). An advanced management via the involvement of multiple stakeholders through a collaborative planning mode is encouraged by recent studies, as a great self-improvement in urban planning process (Dempsey et al., 2012a, Vallance et al., 2011, Winston and Pareja Eastaway, 2008).

Studies indicate that sustainable neighbourhoods need strong **social stability** (Polèse and Stren, 2000, Fang, 2006). It is usually a symbol of a neighbourhood's decline and failure when residents continue to move out (Shumaker and Stokols, 1982). Usually, people are reluctant to leave convenient surroundings to which they have grown accustomed and become attached (Seek, 1983). However, considerable residential mobility is driven by the individual unhappiness in a neighbourhood (Winstanley et al., 2002). Stability may also be reflected in resident behaviours and attitudes toward their lives (Henderson-Wilson, 2010). Moreover, as a prerequisite for a vital city and a successful neighbourhood (Oc and Tiesdell, 1999), the significance of safety can never be ignored. The unsafe feeling definitely jeopardizes social sustainability: 'not only does this contribute to the physical and economic degradation of spaces, but the fear of crime also prevents inhabitants from actively experiencing pleasant day-to-day lives' (Saraiva and Pinho, 2011, p.213). The pursuit of a stable and safe neighbourhood is judged as a crucial component of community

development and a constant concern of urban planning policy.

Effective **neighbourhood governance** is often regarded as the ultimate stage of social sustainability development (Pollock and Whitelaw, 2005, Foley and Martin, 2000). To fulfil social justice, it also needs to be a process during which inhabitants could defend and safeguard their social rights (Davidson et al., 2012). The effective management of neighbourhoods now has a great meaning in China (Wang and Gu, 2002), as the old stewardship system has temporarily fallen into a predicament (Wu, 2002). Neighbourhood-based development in most Chinese cities is part of their rapid urban transformation processes, during which the role of neighbourhood governance should be more important than ever. There are several involved stakeholders: property management team, residents and their founded inner owner committee, and local community office/station. The muti-perspectives of stewardship provides a more diverse, equal and comprehensive thinking on social sustainability through collaboration, which is suggested to be an indispensable part of urban governance (Warburton, 2013, Mathur et al., 2008). Furthermore, community-led growth is suggested as providing a impetus to urban regeneration for many cities (Cebulla et al., 2000), in which the effective governance approach becomes the core determinant of its success (Brownill and Carpenter, 2009).

4.4 Developing Indicators Under the New Framework

4.4.1 The steps of producing indicators

For urban studies, indicators are suggested to be 'multi-dimensional, multi-disciplinary indices with sub-themes developed with care to evaluate and measure the status of an area in terms of progress towards sustainability' (Ghosh et al., 2006, p.264). The indicators provide a basic understanding of the urban environment by assessing its current status (Huang et al., 1998). To develop an effective indicator system, a proper procedure is suggested as being necessary (Wong, 2003, Hemphill et al., 2004b, Ghosh et al., 2006). Wong (2006, p.105) proposed a four-step process: conceptual consolidation; analytical structuring; identification of indicators; and synthesis of indicator values. After the

establishment of the framework of 'social sustainability', its three-layered structure and the inclusion of each layer, the first two steps have been completed.

Now the task is to elaborately identify and generate indicators for assessing social sustainability. Although related urban research and interdisciplinary studies have provided considerable references for generating sustainability indicators, it is still essential to review the relevant criterion and principle for selecting high-quality indicators. Maclaren (1996) summarised that urban sustainability indicators should be integrating, distributional, developed from multiple stakeholders and forward-looking. For neighbourhood social sustainability, firstly they have to be relevant to the conceptual framework and enjoy wide academic acceptance. Secondly, objective and subjective measures both need to be integrated into the approach (von Wirth et al., 2014, Campbell, 1976). As social sustainability is more concerned with people, subjective perceptions of inhabitants should be prominently considered, along with other objective indicators. Thirdly, the consideration in terms of spatial distribution have to be equal (Harmon, 2008, Maclaren, 1996). For this research, the indicators need to be coherent for widespread application across many types of Chinese neighbourhoods that coexist in this transitional period. Furthermore, studies have recommended indicators should include multiple stakeholders who are related or involved (AlWaer et al., 2008, Harmon, 2008). For Chinese urban neighbourhoods, the indicators should include the indicators representing physical planning elements of the neighbourhood, perception and feelings of residents, neighbour mutual relationships, the management and governance of neighbourhood from the collaboration of multiple stakeholders. Finally, a necessary inter-generation consideration (Harmon, 2008) requires a long-term perspective that could guide and monitor neighbourhood development and redevelopment in future. For urban neighbourhoods, spatial features are a traditional focus of Chinese planning processes. However, more social indicators are required to link the physical inputs with social outcomes as a benchmark for urban growth and planning practice.

The collection and interpretation of indicators need to cover issues identified as important both from a scientific point of view and stakeholders' concerns (Mascarenhas et al., 2015). The suitability of indicators can be further analysed from summaries of relevant literature, policies as well as discussions with interviewees. For example, the provision of different types of neighbourhood facilities is illustrated in national and local planning guidelines (Ministry of Construction, 1993, Shenzhen, 2013), which are references for deciding related indicators. Similarly, the key contents of neighbourhood governance should be generated from the legitimation point of review. Related indicators can be developed from the review of national community organisation laws (P.R.China, 1990, P.R.China, 2007b) and local neighbourhood governance rules (Shenzhen, 1998, Shenzhen, 2012b). For some items that have not been cleared stated by documents, their relevance and availability can be further discussed with local planning officers and neighbourhood stakeholders.

However, an important issue for the development of indicators is practicability, which has been suggested by several studies (Ganser, 2008, Ghosh et al., 2006) with implied criticisms of some existing indicator systems. Some systems seem to have included too many random indicators (McAlpine and Birnie, 2005). Disequilibrium of indicators against different themes is also common (Dahl, 2012). To narrow down the potential numerous indicators, several key principles have to be followed. According to Hart (2006), an effective indicator has to be relevant, easy to understand, reliable and based on accessible data. In particular, data accessibility, data quality and data reliability can be decisive for the final indicators (Wong, 2006). Thus, the eventual selection of indicators is often not as ambitious as it was initially planned to be, due to the real challenges in accessing the data. This thus means feasibility of data collection approaches have to be considered as part of the process of indicator selection. Lastly, measurability and comparability are also required. A prejudgment is also necessary for the type and range of data as well as its analytical framework, although there might be an opportunity for moderate adjustment during the later data collection and data analysis stages.

Following the above discussion on some important principles, a scoring method was used to select appropriate indicators. Four essential factors were examined for potential indicators: relevance, understandability, reliability, accessibility. Each factor was judged by a three-level scoring system (see Table 4.1): good(***), acceptable(**) and poor(*).A series of indicators that have been frequently quoted and used in related mainstream studies are listed in Tables 4.2-4.7 for visually comparisons. The four factors are simultaneously considered and indicator with a 'poor' score in any of these factors will not be selected.

Table 4.1 The scoring method applied for selecting indicators

(1) Relevance
*** Indicator is closely related to the designated theme and has been commonly discussed in recent urban and neighbourhood planning theory and practice.
** Indicator is related to designated theme, but is not exclusive to urban and neighbourhood planning topics. It is also widely discussed in other disciplines.
* Indicator is not relevant because it is not related to the listed theme or has no obvious contribution to the planning and neighbourhood development knowledge.
(2) Understandability
*** Indicator can be easily understood by researchers, stakeholders and residents because of its clear definition and meaning.
** Indicator may not be familiar with stakeholders and residents but can still be applicable after necessary interpretations and transformations, e.g. stability by rental households
* Indicator cannot be fully explained to stakeholders, especially residents. For instance, it is a specific academic term that is too abstract, e.g. walkability.
(3) Reliability
*** Indicator has good reliability because of its broad use across different nations and urban contexts and is thus trustworthy in practical assessments.
** Indicator has acceptable reliability because of a considerable number of adoptions in related literature, but is often diversified in different countries. However, confusions can be avoided for its meaning is clear when applied to a bounded Chinese neighbourhood.
* Indicator has poor reliability as it is only applicable in certain limited research. Some are

often too controversial, meanwhile some are associated with poor understandability, e.g. the user experience of public space and eco-friendly neighbourhood
(4) Accessibility *** Indicator has good accessibility because its information can be easily collected from first-hand or second-hand database. ** Indicator has acceptable accessibility. Its information may be accessed by first-hand or second-hand data after overcoming some potential obstructions, for instance, conducting a questionnaire survey in a gated neighbourhoods could be negotiable with its gatekeeper. * Indicator has poor accessibility because of some significant obstructions in data collection, e.g. lacking formal statistics, being commercial sensitive or having difficulties in getting legal permission.

4.4.2 The indicators for the layer 'Basic Needs'

(1) Five indicators assessing external amenities

Satisfaction of basic needs is greatly influenced by the provision of supportive facilities, such as schools, shops, restaurants as well as health & medical centres, sports & fitness venues that are all related to an inhabitant's daily life. The importance of amenities has been advocated by the Chinese national planning policy since the last century (Ministry of Construction, 1993). A guiding index (Table 4.2) shows the types of amenities and their suggested volumes during the development of local urban neighbourhoods. Following the traditional focuses of the physical planning system, the generation of related external liveability indicators appears to be objective. Although being quantitatively designed, these indicators are still targeting the subjective liveability of residents by using individual satisfaction with these amenities, not using the actual number of facilities built during the construction process.

Following the planning policy perspective, five types of amenities are selected and developed as indicators. The first core indicator is the satisfaction with education facilities, the amount of which is required to be significant in the planning regulation (Table 4.2).

Another key indicator is the satisfaction with commercial facilities. Undoubtedly, the development of Chinese neighbourhoods now greatly encourages spatial mixed-use and adequate stores and shops should be accessible nearby. The satisfaction with health facilities, culture facilities and social welfare are also selected as indicators, according to their significance designated by the planning policy. The type of sports facilities, although also mentioned by the policy, is temporally excluded in this section but will be discussed in the latter part. Utilities are less relevant to the satisfaction of basic needs, although the planning index gives it a high quotation. Public transport accessibility is often discussed as being vital in a Western context (Dempsey et al., 2011, Currie and Stanley, 2008). For Chinese urban neighbourhoods, the satisfaction with the accessibility to public transport is an important topic for neighbourhood (Ji and Gao, 2010) and is also included in this assessment.

Table 4.2 A shortlist of required neighbourhood external facilities from Chinese planning policy [1]

Usage of Facilities	Planning Requirement [2]	Significance	Selected
Elementary Education	330～1200	***	**Y**
Health	38～98	**	**Y**
Culture/Sports [3]	45～75	**	**Y**
Commerce	450～570	***	**Y**
Civil Service/Social Welfare [4]	59～292	**	**Y**
Financial, Post and Telecommunication	16～22	*	N
Utilities	30～140	*	**N**
Administration	----	*	N

1 Indicators in this table are all generated from the same policy document, and thus have very similar scores regarding the four factors: relevance, understandability, reliability, accessibility. They are not illustrated again in this table. The significance of each type of facilities has been stated on the policy and the area index required by the regulations is also used as a reference.

2 The index is calculated by m^2 per thousand capita for a residential quarter level neighbourhood. Source: National residential planning regulation (Ministry of Construction, 1993) 3 Sports facilities was previously as an external element in a mixture with cultural facilities, but it has been recently practiced as embedded into neighbourhood development with internal provisions. 4 The planning of social welfare facilities is a new inclusion in megacities like Shenzhen.

Although widely included in the Western background research (Colantonio, 2008, Winston and Pareja Eastaway, 2008), some services such as higher education, and employment are

excluded from the indicators of external liveability. The reason is that these contents are neither the mandatory needs of residents at the present nor the target of neighbourhood level planning. They might be suitable for a higher-level urban study context, for example, master plans or other specific plans, but not applicable to the focus of this research.

(2) Four indicators assessing internal liveability

The internal liveability satisfaction is tangible for inhabitants as it is close to their daily lives. In China, several elements are essential in the shaping of inner liveability, including neighbourhood inner surrounding and public space, sports facilities/ inner playgrounds and other supportive spaces such as parking space. The first key element relates to neighbourhood public space, the significance of which has already been stated in the previous discussion of the layer social networks. For most new neighbourhoods developed after the 1990s, high-quality public space has been required to be deliberately designed. Secondly, many studies show that leisure and exercises inside neighbourhoods are essential (Johnson and Backman, 2010, Lanfear, 2012), as they provide a wide variety of recreational experiences with the expectation of enjoyment and personal satisfaction. The satisfaction with inner surrounding and inner playgrounds/sports facilities are thus relevant (Bennet et al., 2012). The accessibility to car parking spaces is also increasingly related to the satisfaction of basic needs. There is a high demand for it in Chinese neighbourhoods with the rapid growth of car ownership among urban residents. Additionally, it has to be noticed that many sports facilities and parking spaces that used to be externally provided have become unique internal assets of neighbourhoods with the prevalence of the gated neighbourhood form in China. Thus, they are included in this section of internal liveability instead.

A list of potential indicators can be seen in Table 4.3. Some indicators, although appeared in studies (Mehta, 2014, Woodhouse, 2011), lack clarity, understandability and practical approaches, such as the ‘using experience of public space’ and ‘perceived interestingness of inner areas’. Similarly, the meaning of neighbourhood walkability could not be easily

identified by residents although professions often encourage a pedestrian-friendly design in practice (Ou et al., 2005, Kaczynski and Glover, 2012). Four indicators are conclusively selected: the satisfaction with the quality of public space, the satisfaction with neighbourhood inner surrounding, the satisfaction with sports playgrounds/facilities and the satisfaction with the number of parking spaces.

Table 4.3 A shortlist of internal liveability indicators

Indicator	Relevance	Understandability	Reliability	Accessibility	Selected
Satisfaction with the quality of public space	***	***	**	**	Y
Experience of using public space	**	**	*	*	N
Perceived interestingness of inner areas	*	*	*	*	N
Satisfaction with inner surrounding	**	***	**	**	Y
Satisfaction of green areas	**	**	**	*	N
Internal walkability of neighbourhoods	**	*	*	**	N
Satisfaction with sport playground/ facilities	**	***	**	**	Y
Available car parking spaces	**	**	**	*	N
Satisfaction with car parking spaces	**	***	**	**	Y

4.4.3 The indicators for the layer 'Social Networks'

(1) Five indicators for assessing social cohesion

As discussed above, social cohesion is an essential component. The literature suggests it has many key elements that may need be measured by indicators: common value, membership, influence, reinforcement and needs fulfillments and shared emotional connectivity (McMillan and Chavis, 1986). Other considerations may be from community social order (Kearns and Forrest, 2000) and the degree of social tolerance and solidarity (Vreeker et al., 2009). In this study, indicators for neighbourhood identification and social relations are generated, which are regarded as the two aspects of social cohesion by Rajulton et al. (2007).

The first two indicators, 'neighbourhood sense of belonging' and 'character and distinction' inquire about community concept and focus on its identification. A key indicator, 'sense of belonging', which can be also known as 'sense of community' (Talen, 1999, Peterson et al., 2008), is defined as 'a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members needs will be met through their commitment to be together' (McMillan & Chavis, 1986, p.9). The perception of sense of belonging from residents will be an important component of the assessment in order to understand the identity and attachment of Chinese urban neighbourhoods. Besides the importance of neighbourhood sense, the overall character and distinction is also recognised as a core value (Gieryn, 2000, Wilkinson, 2007, Greater London Authority, 2013). Character of neighbourhood is often from a social 'identification' or 'attachment' of neighbourhoods and has a specific capacity to an enhance individual's willingness to stay (Wilkinson, 2007).

Table 4.4 A shortlist of social cohesion indicators

Indicator	Relevance	Understandability	Reliability	Accessibility	Selected
Sense of belonging	***	**	**	**	Y
Character & Distinction	**	***	**	**	Y
Neighbour mutual recognition	***	**	**	**	Y
Neighbour mutual support/helpfulness	***	**	**	**	Y
Rate of conflicts	*	*	*	*	N
Social group membership	**	***	***	**	Y
Number of social groups	**	***	**	*	N

The other three indicators are adopted to evaluate neighbour relationships (Table 4.4): neighbour mutual recognition, mutual helpfulness and social group membership. Despite the increasing disappearance of local ties for adults and more dissociated forms of local interaction in Chinese neighbourhoods (He and Wu, 2007, Douglass et al., 2012), scholars claim that neighbours still retain greater importance for inhabitants, especially for special groups like children, the elderly and the poor (Campo et al., 2009). The indicator neighbour

mutual recognition is developed to directly evaluate the local social tie of residents inside their neighbourhoods. The indicator of mutual helpfulness considers the real feeling of residents from their relationships with neighbours in terms of the importance of offering and receiving help. The indicator social group membership represent the mutual connectivity of inhabitants in terms of resident joining social groups (Robinson, 2005). The number of neighbourhood-based social groups was initially supposed to be an alternative indicator. However, a lack of accurate statistics on the self-founded groups inside Chinese neighbourhoods makes the measurement difficult. This data measurement issue will be recalled in latter case study chapters.

(2) Five indicators for assessing social interactions

Social interactions within the neighbourhood can be evaluated in two aspects: the connectedness of population and individual motivation. Both of them are necessary and a synthesised result will be more reliable (Paquet et al., 2010, Doi et al., 2008). The observed frequency of activities is a widely accepted indicator in social science (Haggerty, 1982, Gehl and Gemzoe, 2004, Brownson et al., 2001). It represents the demographic strength of interaction, calculated by the proportion of observed activities within the sample population within a certain observation period. The intensity of outdoor activities is another frequently used measurement in urban studies, which applies a similar observation but focuses on the spatial strength of activities within a bounded area (here it is neighbourhood) (Gehl and Gemzoe, 2004). Moreover, the variety of outdoor activities can reflect the richness and deepness of social interactions. The classification is based on Gehl's contribution who categorised activities into three types (Gehl, 1971): necessary activities, optional activities, and social activities (resultant activities). A large volume of strong activities and diverse types of movements are good signs of vigorous social networks within a neighbourhood and close neighbour relations. Subject to neighbourhood patterns and site conditions, outdoor activities may spread out within the entire neighbourhood spaces. The distribution of activities, although mentioned in some studies (Semenza and March, 2009), is not considered as an meaningful indicator in this research, due to the lack of a feasible

data collection instrument and effective spatial analysis approaches.

For individual motivation which is a subjective assessment of social interaction, two indicators are developed (Table 4.5). To evaluate the strength of individual activities, the indicator 'individual time spent on neighbourhood activities' is a time-scale based measurement. Such technique is used instead of direct asking for the perception of the activities' strength because it is much clearer for participants and more reliable for the investigators (Cerin et al., 2013a, Su et al., 2014). The indicator 'willingness to participate in social activities' investigates to what extent inhabitants would like to be involved in neighbourhood-based activities. This technique also follows the special series of developing time-use indicators (Harvey, 1990, Zhou et al., 2012, Spinney et al., 2011) and compares the individual time spent on activities inside and outside their neighbourhoods. From both the above objective and subjective indicators, the social interactions within neighbourhood residents can be comprehensively understood.

Table 4.5 A shortlist of social interaction indicators

Indicator	Relevance	Understandability	Reliability	Accessibility	Selected
Observed frequency of outdoor activities	***	***	***	**	Y
Distribution of outdoor activities	**	**	*	*	N
Spatial intensity of outdoor activities	***	***	***	**	Y
Strength of social activities	**	**	**	**	Y
Perception of friendly activities	**	*	*	*	N
Willingness to participate in social activities	**	***	**	**	Y
Perception of the diversity of activities	**	*	*	*	N
Individual time spent on outdoor activities	**	**	**	**	Y

4.4.4 The indicators for the layer 'Community Development'

(1) Six indicators for assessing neighbourhood stability

As discussed in section 4.3.4, a high degree of stability is suggested to be crucial for a sustainable neighbourhood (Bramley et al., 2009, Shumaker and Stokols, 1982). Four indicators are adopted for the assessment of neighbourhood stability (Table 4.6). Firstly, indicators need to be identified which help to measure the overall residential stability of urban neighbourhoods. The indicator 'population stability' represents the general stability of a neighbourhood measured by its population flow. Meanwhile, residential stability could also be reflected by another indicator 'occupancy stability', which is about the level of home ownership. The proportion of rental to ownership is often seen as an indicator of choice for assessments within a neighbourhood (Speare et al., 1975, Kennedy, 1984). Secondly, the significance of safety to a stable neighbourhood is indisputable. A high level of neighbourhood safety is a symbol of respected social development (Austin et al., 2002). Similar to a number of previous studies (Berkeley, 2012, Grohe, 2011), this research also chooses key subjective and objective safety indicators as part of the assessment. The social atmosphere of a neighbourhood and the attitudes and ties of residents can greatly contribute to reducing crime and strengthening safety (Zani et al., 2001, Brunson et al., 2001). The perception of the true feeling of residents with regards their safety is always regarded as a necessary safety indicator by mainstream studies. A low crime rate is suggested to be another key social outcome for a safe neighbourhood (Malleson et al., 2013, Newman, 1995, Abdullah et al., 2012). The crime rate can be directly used to present safety because this reliable data is based on previous records and summarises the general incidents that have happened in local areas. Hence, the result of local crime reports are useful indicators presenting the objective safety level of neighbourhoods in reality. Theoretically some social structure indicators may be associated stability, such as age and social class and income. For instance, Dempsey et al.(2012a, p.125) indicated that 'participants with families and participants who were younger and without children were more likely than older participants to consider moving house'. Whilst these seem to be direct determinants of stability according to the findings observed in Western studies, they have not been evidenced in Chinese urban context. Thus, they are inappropriate for this assessment.

Table 4.6 A shortlist of neighbourhood stability indicators

Indicator	Relevance	Understandability	Reliability	Accessibility	Selected
Stability					
Population stability	***	**	***	**	Y
Occupancy stability	***	***	***	**	Y
Mixed tenure	*	*	*	*	N
Income and class	**	**	*	*	N
Crime rate	***	***	***	**	Y
Perceived of safety	***	**	***	***	Y
Neighbourhood accessibility	**	*	**	*	N
'Eyes' space	*	*	*	*	N
Camera surveillance	**	***	**	*	N
Outdoor lighting facilities	**	*	**	**	N

There are some unselected factors that are worth a further explanation. In the literature, alongside the above social indicators, some physical indicators are also preferred by some scholars to measure neighbourhood safety (Glasson and Cozens, 2011, Saraiva and Pinho, 2011). Advocates claim that neighbourhood safety could be effectively controlled by physical factors, such as improving camera surveillance, security facilities, and lighting environment (Samuels, 2005, Tahir and Hussin, 2012). It might be true at a certain degree, however, it has also been questioned by many other researchers (Firmino et al., 2013, Brunson et al., 2001). For example, camera surveillance, on the contrary, is far more appealing in theory than it proved to be in practice, as 'significantly fewer residents perceived the cameras as effective in reducing crime, encouraging people to report more incidents, and helping the police to respond more quickly following its implementation' (Gill et al., 2007, p.322). But for this research, besides the above debate on the physical indicators, social indicators are still more eligible for a social sustainability assessment, as the focus on physical elements reopens up the debate regarding planning inputs, not social outcomes.

(2) Six indicators for assessing neighbourhood governance

Urban governance and community organisation systems are special and complicated in China (P.R.China, 1990), which have been discussed in Chapter 3. There are two key scopes to develop indicators for this theme: one by discussing neighbourhood inner management and affairs; another by viewing the outer neighbourhood networks in the current urban governance system. For internal affair, the owner committee provides the general neighbourhood stewardship and leadership, and its relationships with property management team and local community office/station are increasingly becoming different. However, the key concerns of neighbourhood inner affairs are always on property management and community service (Zhang and Yan, 2014, Shieh and Friedmann, 2008). Hence, two indicators are developed for it: the satisfaction with property management and community service provision.

Secondly, neighbourhood governance is also a development of democracy in which a bottom-up mode has been encouraged by studies, especially through the approach of public participation (Sirianni, 2007). Voices from residents and their desires to improve their neighbourhood via participation are often claimed to be a great outcome for social sustainability (Lubove, 1965, Wates and Knevitt, 1987, Warburton, 2013). Conversely, 'reduced participation in community affairs is threatening the social sustainability of some communities' (Kelly and Hosking, 2008, p.576). As a higher level of community development should have the engagement of community members, it becomes crucial to assess participation in neighbourhood governance through indicators. Related to the process of neighbourhood governance in China, the degree of engagement in property management and community affairs are selected as key representative indicators.

Both Western and Chinese research have suggested that residents are willing to assume the responsibility for the governance of their local environment (Wates and Knevitt, 1987, Collinge, 1999, Xu, 2001, Tang, 2015). Individual or collective works inside neighbourhoods can shape an ability of self-governance (Galster et al., 2007). A supportive self-governance

process will shape an endogenous mechanism and enhance community development with the resilience of growth (Pollock and Whitelaw, 2005). Hence, the indicator 'degree of self-governance' evaluates the organisation of a neighbourhood. In China, effective self-management will decrease the massive workload of local community offices and stations, which are already largely insufficient in many Chinese cities (Ying, 2004b). As a bottom-up apporach, this can be an effective supplementary to the top-down system which is now insufficient in terms of the bottom-scale governance. Furthermore, the importance of outer collaboration is encouraged by studies (Friedmann and Chen, 2009a). 'Good urban governance practices that seek sustainable development should develop cooperation between local government and grass-root communities, subject to the characteristics of varying local issues' (Davidson et al., 2012, p.61). Never being alone, the development of one neighbourhood has to be related with other nearby neighbourhoods, where a 'mutual collaboration' just applies. It is developed as an indicator assessing the degree of current collaboration between neighbourhoods in local governance.

Clarifications can be made on unselected indicators (Table 4.7). For example, it may be true that a robust neighbourhood could make strong voice and have a high influence (Douvlou and Ryder, 2007). However, the local influence (voice) of a neighbourhood is not an effective indicator due to the difficulty of examination and the lack of public resource in the Chinese urban context. Some democratic indicators, such as leadership and voting, is neither adopted, as they are also ambiguous and inapplicable under the unique institution of the state. Some discussions on neighbourhood charity and non-profits movements are also excluded, as they are not part of the process for community development in China. Lastly, 'local planning involvement' is another factor that needs to be clarified. It may be a current popular issue among planners and professions. However, neighbourhood planning remains unfamiliar among most urban residents. Although essential in the neighbourhood planning process in many Western countries, this soft and social-orientated approach still seems to be an armchair perspective in Chinese neighbourhood development at the present (Xu and Chan, 2011). Thus, this Indicator cannot be applied because of the current

lack of practical engagement from most neighbourhood residents.

Table 4.7 A shortlist of neighbourhood governance indicators

Indicator	Relevance	Understandability	Reliability	Accessibility	Selected
Satisfaction with property management	***	***	***	***	Y
Level of property maintenance	**	**	**	*	N
Satisfaction with community service	***	***	***	***	Y
Property management participation	***	***	**	***	Y
Committee affair participation	***	***	**	***	Y
Leadership and voting	*	*	*	*	N
Local voice and influence	*	*	*	*	N
Degree of self-governance	***	***	***	***	Y
Neighbourhood mutual collaboration	**	**	**	*	Y
Local planning involvement	***	*	**	*	N

Table 4.8 A summary of social sustainability indicators

The Layer of 'Individual Needs' (10 indicators)		The Layer of 'Social Networks' (10 Indicators)		The Layer of 'Community Development' (10 Indicators)	
Theme	Indicator	Theme	Indicator	Theme	Indicator
1.1 External Liveability	1.1.1 Satisfaction with educational facilities	2.1 Social Cohesion	2.1.1 Sense of belonging	3.1 Neighbourhood Stability	3.1.1 Occupancy Stability
	1.1.2 Satisfaction with commercial facilities		2.1.2 Neighbourhood character & distinction		3.1.2 Population Stability
	1.1.3 Satisfaction with healthy facilities		2.1.3 Neighbour mutual recognitions		3.1.3 Crime rate (Objective safety)
	1.1.4 Satisfaction with welfare facilities		2.1.4 Neighbour mutual helpfulness		3.1.4 Perceived of safety
	1.1.5 Satisfaction with cultural facilities		2.1.5 Social group memberships	3.2 Neighbourhood Governance	3.2.1 Satisfaction with Property management
	1.1.6 Satisfaction with public transportation	2.2 Social Interaction	2.2.1 Individual time spent on neighbourhood activities		3.2.2 Satisfaction with community service
1.2 Internal Liveability	1.2.1Satisfaction with public space		2.2.2 Subjective willingness to participate in activities		3.2.3 Property management participation
	1.2.2Satisfaction with inner surrounding		2.2.3 Observed Frequency of activities		3.2.4 Committee affair participation
	1.2.3Satisfaction with sports facilities/playgrounds		2.2.4 Spatial Intensity of activities		3.2.5 Neighbourhood self-governance by residents
	1.2.5 Satisfaction with parking spaces		2.2.3 Strength of social activities		3.2.6 Neighbourhood mutual collaborations

4.5 Conclusion

A new framework of Chinese neighbourhood social sustainability combining the findings

from both the Western and Chinese literature has been developed in this Chapter. Basic needs, social networks and community development are the three layers of this framework, which determine the appraisal dimensions and focus. Each layer is composed of ten indicators, which are all selected by a scoring method under several key princples. A evaluation system is thus generated to assess the social sustainability of Chinese neighbourhoods empirically (Table 4.8). From the process of producing these indicators, accessibility to data has been initially considered. The precise methods for data collection and data analysis will be discussed further in Chapter 5 and 6.

5. CASE STUDY METHODOLOGY

Following the theoretical hypothesis, this chapter aims to develop methods for an empirical case study. Basically the study focuses on 'how neighbourhoods are created in local planning practice', 'what are the levels of social sustainability for the different patterns of urban neighbourhood' and 'is there any correlation between urban form pattern and level of social sustainability'? An embedded case study process is designed to include both an examination of typical local neighbourhoods and a review of the local neighbourhood planning mechanism. Tangible questions are developed from the hypothesis and generated for each targeted investigation. Consequently, a systemic design of the methods of data collection and data analysis is required.

5.1 A case study in Shenzhen

5.1.1 An introduction to the city of Shenzhen and its urbanisation history

Shenzhen is a young city that is located in South China (Figure 5.1). Notwithstanding that it is adjacent to Hong Kong, it was nothing more than a fishing village in the 1950s and a small town with a no more than 30,000 population in the 1970s. However, rapid urbanisation happened after the reform policy, which had induced an enormous increase of urban population and a vast expansion of urban land. The remarkable economic prosperity in the 1990s precipitated the rise of Shenzhen as a new large city in China. This urban transformation is still continuing. Today, with a 1997 km^2 urban area and an over 10 million population, Shenzhen is absolutely a mega-city that undoubtedly can be ranked as one of the 'Big Five' in China. In brief, Shenzhen has developed dramatically as a result of industrialisation, urbanisation and modernisation processes (Wei, 2012), an epitome of the country. However, the massive development of the past mostly relied on the input of labour and land resources to attract foreign capital (Lin, 2004, Ma, 2004). The problems of the immigrant-led demographic structure and the unsustainable land resource are also apparent in this process of high-speed urbanisation.

5.1.2 The reasons for selecting Shenzhen as a case

There are three main reasons to justify Shenzhen as a case study.

- **A top city in China shaped by the recent rapid urbanisation**

Shenzhen has been shaped into one of the top cities in China within a short 30-year period. With an annual growth of 11% during the past two decades, it is an extremely representative case for the recent urbanisation process that have happened in China (Lin, 2004, Zacharias and Tang, 2010). There has also been a worldwide focus on Shenzhen (Zhu, 1996, Ng and Tang, 2004, Bruton et al., 2005, Wu and Ma, 2006) reviewing and analysing its unique pathway. Nevertheless, academic concerns with its planning policies have occurred as well (Bruton et al., 2005, Shen, 2007, Abramson, 2006). Issues such as the chaos of urban texture and the inefficacy of regulation have also been highlighted (Ya et al., 2005, Wen and Ghose, 2010). In this research, some social issues in Shenzhen have already been discussed in Chapters 2 and 3, which may include the decline in neighbourhood social cohesion and a reduction of social interaction amongst its residents.

Figure 5.1 The location of Shenzhen

- **Typical new urban neighbourhoods**

By reference to the previously introduced national neighbourhood evolution history in Chapter 2, neighbourhoods in Shenzhen were mostly developed after the 1980s with a maturity in local commodity housing market and planning regulations established in 1990s. There are few remaining old neighbourhoods and work units in this young city. Now the development of new modern urban neighbourhoods has become a standard procedure, a

typical example of the state's urban planning and real estate industry (Ng and Tang, 2004). Shenzhen is also a real high-density city. Grossly calculated across the entire urban area of 1,996.78 km^2, the overall population density is now 5,323 people per square kilometre (Shenzhen Statistics, 2013). In some central areas, it can be as high as 10,000. In summary, the proportion of new urban neighbourhoods is typically higher in Shenzhen compared with other Chinese cities and the examination of their typical and different patterns can also be easily found concentrated within its urban area.

- **The new community planning endeavour**

Despite general compliance with national planning policies, Shenzhen has some localised contexts to its planning system. Institutional innovations are encouraged by the state according to the city's distinctive role as a '*Special Economy Zone'*. Hence, Shenzhen planners have constantly been taking courageous and innovative practices and many of their achievements have been imitated by other cities throughout the country (Bruton et al., 2005). The master plan of Shenzhen, for example, has won an international prize in 1999[13]; the local 'statutory plan' system of Shenzhen, which will be discussed in Chapter 6, is also a national exemplar (Zacharias and Tang, 2010). However, similarly to the underlying challenges discussed in Chapter 3 throughout the national regime, the development of urban neighbourhoods is also a great challenge for Shenzhen (Cartier, 2002). A new mechanism called 'community planner scheme' was created in 2012. The aim of this scheme was to avoid the isolation of residents in the planning process and to strengthen the public participation in the lower level planning practices (Shenzhen, 2012a). This approach is an attempt of bottom-up planning by professionals in China, which emphasises the importance of the planner's role at the lower level practices. Despite many current issues, the planning endeavour with a particular bottom-up perspective is an increasing popular trend in the country's leading cities, making the Shenzhen experience particularly interesting.

[13] A honorary mention of 'Sir Patrick Abercrombie Reward' was titled by UIA (International Union of Architects) for the Master plan of Shenzhen in 1999.

5.1.3 The case study framework

There is an academic debate on the case study method itself. The concise and clear 'single-case' method, however, is also described as 'vulnerable' (Yin, 2003). Arguments often query the universality of the findings based upon a single case. Indeed choosing the appropriate number of cases, whenever using a 'single case', 'two cases' or 'multiple-cases' approach, has to comply with the research purpose and research design (Gomm et al., 2000, Woodside, 2010), which is also an essential principle for this study. Moreover, the number of cases in research can be altered, depending on the scale at which these cases are focused. For example, in this case study, the implementation of multiple cases are necessary at the lowest level neighbourhood scale, as different patterns of neighbourhood have been theoretically identified and needs to be assessed (see Chapter 3). However, as an embedded case study, all neighbourhoods can constitute a higher-level case (an urban block as part of a planning unit) that is suitable for a planning institutional analysis. At present, most planning units and mature communities are planned similarly and operate throughout the entire city under a similar top-down system. Further from a city perspective, Shenzhen is a single case for the country. However, an extrapolation of the findings from this single case is still possible. This is because the research questions have been identified universal according to the national-level standard planning procedure and many other largest cities in China have similar issues and experiences as the case of Shenzhen, which are also under the similar high-speed urbanisation background. Finally but also essential, the number of cases is usually restricted by realistic factors. In this study, only one city case is selected due to the limitations of the research period and cost, although more city cases could provide stronger evidence.

A case study was carried out in 2013 in Shenzhen. Its foundation of which was grounded regarding the propositions of the typical Chinese planning mechanism (described in Chapter 3) and the social sustainability assessment framework (established in Chapter 4). Operating a case study is suggested to be a systematic process that develops theoretical hypothesis into specific propositions and tests them through the fieldwork (Wengraf, 2001). Thus, this

case study inherits the previous research structure but develops detailed questions set within Shenzhen's local context. The overall case study organisation is shown in Figure 5.2. First at the city level, the study seeks to better understand the processes of local urban neighbourhood development and the detailed planning regulations leading to particular types of neighbourhood form. Qualitative methods were adopted to understand the complex planning process as well as the particular concerns of social sustainability in practice. Secondly, the neighbourhood-level case study focuses on a quantitative appraisal of social sustainability, which is also a benchmark for comparing the local planning input. The appraisal was processed via multiple approaches, including the methods of questionnaire surveys, documentary, interview and observation.

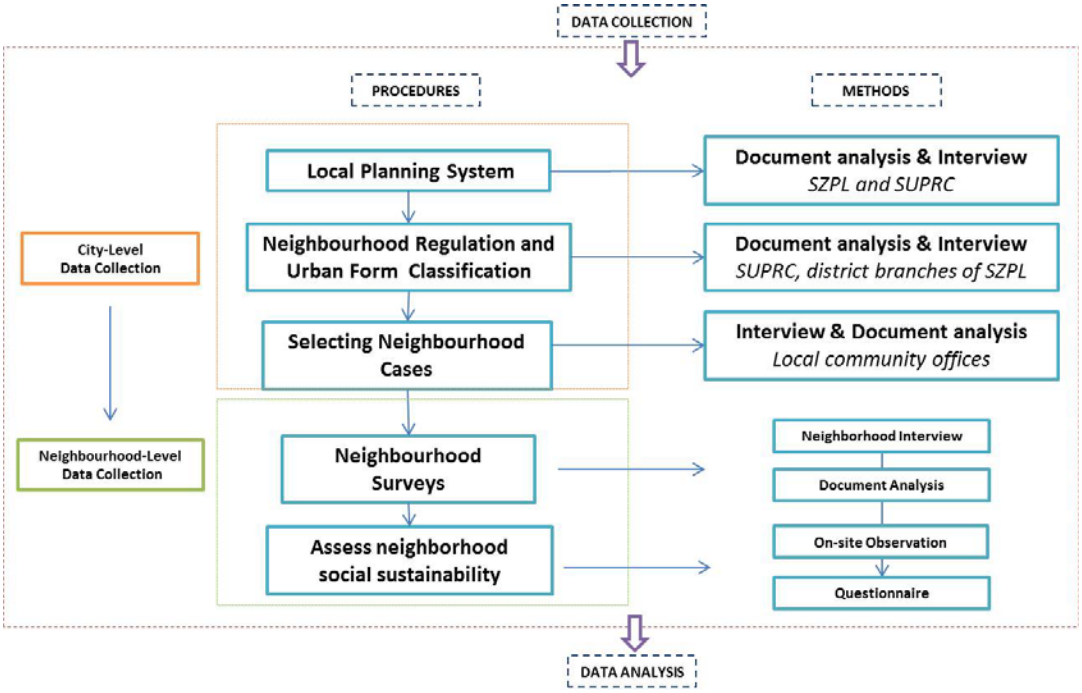

Figure 5.2 The overall research case study design and stages

5.2 The city-level case study: themes and questions

Tangible objectives had been established before the city-level investigation started in 2013. The two prime themes are: (1) 'to understand the neighbourhood development process and planning mechanism' and (2) 'to understand the spatial characteristics and regulations of urban form'. The first theme requires a visit of the localised hierarchical and coherent planning and governance systems, in which the unique development process of

neighbourhoods could be exposed and the relationships between stakeholders could be structured. Thus, detailed questions under the first theme were addressed during the case study in Shenzhen: 1A What is the local planning system? 1B What are the local social sustainability strategies/policies? 1C what are the neighbourhood development process and who are the stakeholders? The second theme requires a thorough understanding of the spatial features of urban neighbourhoods in Shenzhen and a pragmatic classification of urban form based on well-defined parameters. Four questions of this theme were further developed in the case study. 2A What are land use policies? 2B What are the urban form regulations? 2C What are the generic spatial features of urban neighbourhoods? 2D How can the neighbourhood forms be classified? Chapter 6 and Chapter 10 of this thesis will address a review of macro-level policies and an investigation of micro-level regulations respectively, in which the document, interview and spatial analysis methods were systematically designed to answer these questions (Table 5.1).

Table 5.1 A summary of city-level survey methods

Theme Code	Question Code	Method
1 Policies guiding	1A The local planning system	Document, Interview
neighbourhood development	1B Social sustainability strategies /policies	Document, Interview
	1C Neighbourhood development process and stakeholders	Document, Interview
2 Regulation on	2A Land use policies	Document, Interview
neighbourhood forms	2B Urban form regulations	Document, Interview
	2C The generic features of urban form	GIS spatial programme
	2D A practical classification of neighbourhood forms	GIS spatial programme

5.2.1 Document and interview instruments

As two important qualitative research methods, documentary reviews and interviews are both adopted in this case study. The document method is mostly effective in understanding the existing planning achievements. (Matthews and Ross, 2010) indicated that a document analysis, especially using formal census data, public surveys, government policies are essential for social science research. The analyses of the massive archives collected in Shenzhen include the contents of plans, maps and policies and statistics information.

Currently, there has been a large volume of officially issued plans that are used to guide urban development at different levels. At the same time, regulation techniques are already on a legal track with detailed statements on the control of urban form. They are often described as local planning guidelines. A review of these related planning strategies and guidelines inside the system has a benefit for summarising the existing policy response to socially unsustainable issues. The attitudes and actions of planning practice can be better understood by identifying the real problems and the institutional considerations.

However, many issues relating to social sustainability may not be fully stated in existing archives or published reports. Some invisible factors that exist in neighbourhood development need further exploration. In real projects, how the planning regulations decide the neighbourhood land, population and site scale are often internal works that operate behind the scenes. Moreover, motivations of some designs or developments may be very vague. As a result, the interview methods are a supplementary approach, especially for the questions with insufficient data or unclear statements. Consequently, many facts and attitudes of the current planning policies and socially sustainable development came from the interview method through direct and indirect questions. Typically associated with the qualitative data, this method is suggested to be particularly suitable for the questions concerning attitudes and experiences (Wengraf, 2001). Many interviewees are also the related stakeholders in the local neighbourhood development process. For example, targeted interviewees were processed across different departments of the local authority, where governmental planners and officers make local plans and have responsibilities for guiding a sustainable neighbourhood development. During the case study, most of the interviews were semi-structured, in which targeted questions and flexible discussions were together addressed. The virtue of this approach starts with achieving presupposed goals by seeking answers to key questions in the interview. It also allows the participants to express their views independently and extend their points and opinions finally. Moreover, multiple methods were employed, including the face to face, telephone and group interviews. Many interviewees were interviewed by face-to-face discussions. However, several interviewees

who were unable to attend were finally accessed via telephone interviews. For specific topics that attracted many institutions and interviewees, group interviews were also designed with the help of Shenzhen Urban Planning & Land Resources Research Center (SUPRC). As suggsted by the literature (Willis, 2005), the involvement of several interviewees and an interactive discussion between them can be beneficial.

5.2.2 Spatial analysis (GIS) instrument

During the case study, the local geographical database had been agreed as being accessible for partial research purposes by its provider, the Shenzhen Urban Planning and Land Resources Research Centre (SUPRC). In this research, all the results from the use of the local GIS data, particularly the drawings of many maps, will be specially indicated as 'resources were from the SUPRC'. With a special target of understanding current characteristics of urban form, a GIS-based spatial analysis was applied to display the general trends, ranges and distributions of different types of land use and urban neighbourhood. The spatial variable site scale that reflects the current horizontal spatial features of urban land and neighbourhoods sites were directly analysed and classified in the GIS platform using the coded 'plot area' data. Similarly, the FAR that was used to display the vertical urban development could also be read and categorised on this platform. Essentially, a classification of the Shenzhen neighbourhoods could be completed by taking the following steps: 1) defining neighbourhood sites and demarcating; then, 2) setting up spatial variable ranges to classify their layered groups; and, 3) classifying each neighbourhood by their attributes using overlapping maps. The classification results were visible in multiple colours and gradually variational layers. Charts, diagrams and scatter plots can be drawn to present other spatial analysis results based on the GIS platform. The synthesis of these spatial features could describe the general tendency of the overall urban development from many aspects. Most urban neighbourhoods can thus be coded with a specific 'group attribute', as the basis for the next stage, case study selection. Alongside a city-level spatial analysis, neighbourhood-based spatial analysis could present implementation results of planning regulations and practical linkages between spatial variables. However, some other spatial

information, such as parking spaces, green ratios could not be directly identified from the GIS database. This data would have to be collected manually if it was thought necessary. In this research, they partly came from the resources gathered during the interviews, in a combination with other online published plans and documents.

5.2.3 Deciding neighbourhood cases

Additionally, the selection of neighbourhood cases followed certain principles. Firstly, cases should be able to represent certain typical patterns of neighbourhoods in Shenzhen. Thanks to the local GIS database, a practical classification of neighbourhood form will be created via the spatial analysis. Secondly, the case study should be able to reflect the local planning system. At present, the planning regulations operate through many 'planning units', which control neighbourhoods and other spatial resources within a limited area. Thus, it requires selected neighbourhoods to be located in one or two planning units, not widely spread across the city. Otherwise, cross-boundary comparisons would be difficult. The last principle is to try to control the exogenous variables that are irrelevant to the research topic. As the focus of this study is on the role of urban form, impacts led by other socioeconomic factors have to be effectively controlled. The effect of location, for example, has to be considered. If selecting multiple cases crossing the core and outskirt areas, a focus on the social variation influenced by different urban forms would not make sense. This is because the impact of the urban form may be less significant than the impact of other macro-level inputs, such as the great difference in the development of local infrastructure between the core and outskirt. Factors that need controlling may also include transport connectivity, general housing condition and effectiveness of planning regulation. As a result regarding these principles, selecting multiple cases in a similar area can be an appropriate approach to minimise extraneous influences in practice. In this situation, most factors will not be greatly different so that the urban form-based assessment and comparison can be the focus of attention. However, this requires the researcher to observe and make some prejudgments, especially on neighbourhood patterns and planning implementations. Before making the final decision, selecting several potential areas, comparing some socio factors and preparing

a shortlist of potential cases could be very useful.

5.3 The neighbourhood-level case study: assessing social sustainability

The social sustainability appraisal is the core of this research, which **is mainly quantitatively assessed through questionnaire, assisted by observation and documentary methods** (Table 5.2). However, basic information concerning bottom-level neighbourhoods, as beyond the scope of the centralised planning system, may be vague or inaccurate. As a result, the stakeholder participated interviews were undertaken the earliest, in which necessary data that required was gathered and an understanding of the lowest-level of neighbourhood governance was facilitated. In the next phase, spatial information was either manipulated from the city's GIS platform or from relevant neighbourhood maps. The precise neighbourhood demographic data also improved the sampling accuracy. The quantitative questionnaire survey was the final stage; however, it took the most time during the entire case study stage. A pilot study was elaborately prepared before the large issuing of questionnaires in local neighbourhoods, which will be additionally discussed in Chapter 6.

Table 5.2 A summary of neighbourhood-level survey data collection methods

Theme Code	Question Code	Method
3 social sustainability	3A External liveability	Questionnaire
	3B Internal liveability	Questionnaire
	3C Social cohesion	Questionnaire
	3D Social interaction	Observation, Questionnaire
	3E Neighbourhood stability	Document, Questionnaire
	3F Neighbourhood governance	Questionnaire
4 stakeholders' Involvements	4A Local community governance, immigrants issues	Interview
	4B Developers' voice and the processing of neighbourhood projects	Interview
	4C Neighbourhood committee and participation of residents	Interview
	4D The management of gated neighbourhoods	Interview
	4E Local public security and neighbourhood safety	Document, Interview

5.3.1 Questionnaire instrument

As a ubiquitous method to assess personality, beliefs and attitudes (Wellington and Szczerbiński, 2007), the implementation of questionnaires is the most crucial stage of this case study analysis. The content of the questionnaire includes the three layers of social sustainability: basic needs, social networks and community development, which however, had been explicitly explained through plain questions about their feelings and attitudes towards their local neighbourhoods. The first important issue was **the way of operating questionnaires**. Undoubtedly, different approaches have their own advantages and disadvantages. The internet-based questionnaire, although more efficient in terms of time and cost, may cause biases, as there may be a considerable proportion of population who has no access to the internet or no ability to answer in this way, especially amongst the elderly. The use of postal questionnaire can also save time, as it allows a parallel operation of the questionnaire among multiple cases. Some respondents may have potential weak reading abilities and comprehension abilities (Olsen, 2011), the questionnaire needs to be written with full and clear instructions. However, the problem of low response rate still commonly exists in postal questionnaires (Gilbert, 2008). The face-to-face questionnaire is reliable due to the researcher's participation (Bryman, 2012), in which invalid answers can be to a large extent negated. However, it will inevitably increase the survey period and costs.

In the case study phase of this research, a factor that could fundamentally determine the questionnaire method was whether an on-site survey could be allowed to be undertaken inside neighbourhoods. Due to the restriction by the gated residential management, some neighbourhoods did not approve researcher's direct face-to-face survey request. As a result, a combination of multiple approaches had to be taken during the survey. Positive response rates were received when the face to face questionnaire survey was carried out, thanks to the assistance of volunteers and some neighbourhood committees. The use of a postal questionnaire was the remaining survey choice for the neighbourhoods where there were no face-to-face investigating opportunities.

Secondly, the large populations in local neighbourhoods required **a sampling method** to administer the questionnaire survey. The issue of **sample size** needs to be clarified from the outset. Sample size refers to the number of units chosen in the survey from which data was gathered (Lavrakas, 2008). However, so far there is no exact or straightforward answer for the appropriate size required for a questionnaire survey. Gathering real statistics from the population of a case study is the ground for deciding the sample size. Noticeably, a much larger sample size may not mean a higher precision in some questionnaire surveys (Shapiro, 2008). It could even significantly increase the possibility of sample error in the situation of a random sample. Nevertheless, some studies suggest an approximate 3%-5% of the whole investigated population as an effective control of sample size (Frankfort-Nachmias and Nachmias, 2008). Another way is to generate sample size according to estimate the standard error, confidence levels and interval. For this study, the actual population and spatial variations could make the sample size differ. However in practice, the actual response rates are often beyond the reach of many researchers (Wilson, 2013).

Thirdly, choosing correct **sampling methods** was also essential (Bernard, 2000). A feasible sampling method can be a sufficient estimation of a population and a reliable representation of its features (Bryman, 2012). It also needs to comply with the research's focus and actual requirements. For better representing the real situations of local neighbourhoods, a spatially ***stratified random sampling*** method was adopted in this survey. This sampling process also had a hierarchical arrangement, approaching from blocks to households and then individuals in three stages. A Chinese urban neighbourhood is usually constituted by buildings, the basic geographical units. Some small neighbourhoods only have one or two buildings; their geographical variances may not be a significant issue for questionnaire sampling. Nonetheless, inner sub-boundaries in a large neighbourhood usually exist that divide it into several sub-areas or clusters. Residents living in different buildings may be far away from each other, and may have varied opinions due to larger spatial variances. Hence, the spatially stratified sample was the sampling solution. For individuals, decisions were made by residents inside of each household on who was

responsible for answering the questionnaire. However, a basic requirement was that only adult respondents were eligible to answer. It was always announced by the researcher and volunteers when conducting the survey.

Here is an example of the stratified random sampling approach used in this survey. A large-sized neighbourhood with 3,000 households is split into three clusters. The sampling method may require 30 to 45 responses, which was estimated by proper survey confidential level and confidential interval. They were thus equally gathered from 10 to 15 samples in each group. Stratified samples were further applied in each cluster of buildings. Three samples were required for each of the five buildings in this cluster. For getting these samples, households were randomly selected by knocking doors, and one valid response was given representing this household. Occasionally, respondents were randomly chosen from the front of building entrances when the access to household inside buildings was not available. In extreme circumtance, a postal questionnaire was applied instead for few neighbourhoods where the researcher's direct contact with participants was not authorised. The postal dispatching was also designed in a stratified order, with the respondents apportioned according to pre-identified neighbourhood geographic units.

Lastly, the questionnaire content (Appendix 1) was specially developed, which had three parts and contained 26 questions. To make sure respondents understand why and what they need to answer with these questions, a clear illustration was made at the top of the questionnaire. Detailed explanations for certain questions were also given when necessary. Section A was the registration of some basic information of participants, in which useful social-demographical data could also be collected. In Section B, the social sustainability assessment was delivered by essential questions explicitly discussing the elements under the framework 'individual needs', 'social networks' and 'community development'. Section C was a policy indication test about the significance of social sustainability for residents and the value preference of different elements. Additional opinions on neighbourhood development, planning and governance were also welcomed but totally optional. Within

the content, numerous questions were designed using the 'Likert scale' five-point measurement, which has been widely used for testing attitudes in questionnaire surveys (Croasmun and Ostrom, 2011). A middle-value choice for neither agree nor disagree is also a common pattern in the 'Likert scale' (Addington-Hall, 2007).

5.3.2 Observation instrument

The observation method was another substantial component of the social sustainability assessment. Evaluating space quality and design, recording behaviour at specific times and places have often been adopted as visual tools during observation (Atkinson and Delamont, 2010). In this case study, the observation focuses on outdoor physical activities. To explicitly demonstrate the abstract concept human 'interaction', the approach of assessing 'outdoor activity' have been developed by urban researchers (Gehl and Gemzoe, 2004). The outdoor activity contains different levels of actions, which were initially categorised into three types (Gehl, 1971): necessary activities (NA), optional activities (OA) and social activities (SA). Firstly, the NA includes those basic everyday actions under mandatory needs such as walking to work and shopping. But it mostly happens individually, rarely involves social interactions. Secondly, typical OA includes sitting, resting, playing, doing sports alone, babysitting and childminding. The OA, with a full range of vitality, is important because its occurrence means people are happy to relax inside their neighbourhoods. By contrast, when people do not like their environment or feel uncomfortable, the number of OA would decrease. Thirdly, the type of SA encompasses seeing, hearing, active contacts greetings, talking, conversations, children playing, demonstrating a strong social feature of a neighbourhood. Additionally, there are also some interesting cultural activities of SA in China. People in neighbourhoods often play traditional games such as cards or Mahjong in public spaces. Social activities undoubtedly represent strong social interactions and reinforce social ties among residents. The optional activities and social activities are recommended by many researchers (Biddulph, 2012, Zhang and Lawson, 2009) because of their ability to indicate strong social network connections. In this study, only optional and social activities are defined as valid outdoor activities for social interaction assessment.

Although the OA may be less meaningful than the SA in terms of high-level activities, it still underpins social interaction to a certain degree.

In practice, recording outdoor activities are often implemented in empirical studies (Donald, 2011, Matan, 2011). However, a real issue for observation is how to record these activities systematically. The observation opportunity and time are often problematic. Due to the limitation of times and costs, observation in this research is confined to 'observation for a certain period'. To avoid the hot outdoor environment in the summer of Shenzhen during which the activities might be hampered, the research chose to operate observations in October 2013 when the weather was relatively cool and comfortable. The representative recording time was designed between 4 pm and 6 pm. Most outdoor activities happened during this period when people come back from work and relax inside neighbourhoods before sunset. Although a small volunteer group were recruited, it is unlikely to complete the observations of all neighbourhoods in the same day at the same time. Greater manpower and workloads were also required for the observation taken place in some large sites. As a result, 'acceptable equivalent periods' were applied in the series of on-site observations. Their dates and times were selected under similar weathers and similar hours (Appendix Table 3.2), assuming that the basic outdoor conditions for neighbourhood activities were equal and the comparison could be meaningful. The types of activities were coded by series of symbols and recorded on each neighbourhood map by the researcher and volunteers (Appendix Table 3.3). Additional translations and calculations of this raw data, which came from these sub-categories inside the groups of OA and SA, were also necessary.

5.3.3 Interviews and documents

Interviews were additionally undertaken with different stakeholders to understand their current roles and duties in the local level of neighbourhood governance structure. The community offices, neighbourhood developers, property management teams, and resident committees were the four major groups of interviewees. Much useful information was

gathered during these interviews with stakeholders, such as neighbourhood population data, renting household and immigrant data and local crime reports. Another purpose is to investigate whether there is an effective channel to achieve social sustainability in at the lowest neighbourhood scale. Semi-structured interviews were applied to each type of groups, which followed certain topics and questions that were set as clear goals to achieve. However, interviewees were invited to introduce any related issues on their own, depending on their time and willingness to engage in discussions. From their responses and assertions, the perspectives of key stakeholders can be acknowledged and summarised. A series of coding of the questions and interviewees was continued as a sequential classification of their different positions and role-plays (Appendix Table 3.1).

5.4 Ethics of the research survey

A basic guideline of ethical considerations in research is that no individual suffers any adverse consequences from participating in the study (Floyd J. Fowler, 2009). Whether a question is concerned with potentially sensitive or threatening information into content needs to be carefully considered during a survey. Although discussions on some planning defects might be embarrassing for some interviewees, the research's objective of seeking suggestions for shaping more socially sustainable neighbourhoods still attracted many stakeholders' interests. In general, improving social sustainability also contributes to China's urban development process. During the survey, many participants did not refuse to participate following the introduction of these ideas. The researcher ensured that respondents agreed to participate with legal considerations and each participant therefore gave their informed consent. A part of preliminary research reports to the local planning bureau was sent in advance for a discussion. The discussions with local communities, the bottom organisational unit of the city, were also sought for a legal research purpose. The entire research survey was conduced under the approval and support of the local planning bureau, the planning research centre and other departments of local authorities.

5.4.1 Ethical issues in conducting document analyses

First of all, it is essential that the information quoted or illustrated in this research has been authorised for public access. In this case study, the local planning bureau SZPL and its research planning institution SUPRC genuinely provided fruitful data. The using of the data has been agreed within a limited academic boundary. Although some confidential data had been removed initially by its provider, the researcher latterly found certain information were still strictly private and sensitive data needed to be controlled. For example, the neighbourhood crime records could only be displayed in the targeted area. Due to the public security reason, crime records for other areas and districts were not available for comparative benchmarking purposes. Secondly, the examining of archives has to be in-depth, objective and coherent, as many planning policies, documents and maps are generated crossing varied institutions and different time periods. Separate understanding of these documents without connections would be narrow and inaccurate. Therefore, this research unites these archives together and apply a synthesised cross-boundaries study. A penetrating investigation into the hierarchical plans that are issued at different planning levels is also essential. Furthermore, not being a political tool, the investigation should also be neutral and introspective.

5.4.2 Ethical issues in conducting interviews

A brief description of the interview purpose was stated before starting the interviews so that the participants could decide whether to take part in the interview. The main questions were also specified at the beginning of each interview. During the interview, deceptive or inaccurate information was avoided, and it was the researcher's key obligation not to mislead participants. In case that respondents did not wish to answer or could not answer, non-response was allowed. It occasionally happened with certain controversial topics, but the general response rate of interview questions was high. For ethical consideration, some topics/questions may still risk the participants if sensitive information/results were revealed, although they might not have been realised this themselves. Thus in the end, the validity and relevance of every interview was again carefully reviewed. As a result, it is a protection

of the participants if interview results appear with anonymity in the latter part of this research, despite the fact that most interviewees felt it was unnecessary. Coding was also applied to minimise the visible links between answers and names of respondents in the contextual analysis. In all, full ethical considerations had been given to assure the suitability and confidentiality of interviews with all interviewees giving their informed consent to participate.

5.4.3 Ethical issues in conducting observations

The process of conducting the observational survey relied on the gatekeepers within neighbourhoods, as it required a route of initial access to sites and participants. In many private real estate projects in Shenzhen, inner recordings and inquiries were usually not permitted by gatekeepers. As illustrated by Creswell (2009b), the on-site fieldwork may cause some inconvenience to people. To overcome this difficulty, negotiations prior to each observation were made on the access and timetable. All these observations were permitted and operated under a control of survey impacts. For small neighbourhoods, the influence of observation was limited as the number of observers was usually less than three. However, an increasing number was inevitable for observing large sites, for instance, over ten observers were required for a large neighbourhood (LSMD-1, see chapter 6). It was required that the influence of observation should be restrained as low as possible and a full respect to the participants and sites should be given. The observers were arranged to spread out in public spaces and left the sites quietly after the survey. The recording of neighbourhood activities was implemented via ‘paper notes’ in all the cases. Onsite photographing, which has a higher impact on behaviours, was only occasionally used in proofing different kinds of activities inside neighbourhood communities and also only occurred following the permission of participants having been received. Direct face-on-camera in photographs was always avoided.

5.4.4 Ethical issues in conducting questionnaire survey

The first ethical issue is the conducting of questionnaire survey inside neighbourhoods. The

negotiation with neighbourhood management teams and gatekeepers was generally unhindered, thanks to the significant support of the local planning bureau. However, most of the managers insisted in controlling the sociometric influences of the survey. In a few cases, passive postal questionnaires had to be processed instead of the face-to-face method, as active communications with residents were restricted. Secondly, the design of the questionnaire has to include ethical considerations. It is suggested that 'a short questionnaire is more appropriate for the ordinal people' (Neuman, 2007). The questionnaire was thus compactly designed; explicit words and clear instructions were developed to ensure it could be readable for everyone without disputes. The participants of questionnaires were all **ADULTS** (over 18 years old), and the researcher also reminded the participants that participation was voluntary. This was given both verbally and written on the survey questionnaire. To ensure the feeling of participants, the researcher endeavoured to keep the face-to-face conversations smoothly and comfortably. Thirdly, the risk of confidentiality of questionnaire had been considered carefully. Anonymity was assured during the survey and contact details were not required unless participants wished to have further discussions. A statement on the legal use of the data was made, and all answers were protected with respect to the term of confidentiality. In the pilot study, few participants occasionally felt some direct questions impinged on their privacy, such as income and length of residence. The survey method accepted omissions if the respondent felt uncomfortable about providing the information. A further illustration about this was also given on the questionnaire.

In short, all the research work was conducted in conformity with the ethical research guidelines of the University of Liverpool. Participants were invited to participate on a voluntary basis, provided informed consent and were able to provide non-response to some questions. Ethical clearance was acquired before the survey work began.

5.5 Methods for data analysis

5.5.1 A mixed data analysis

A mixture of quantitative and qualitative data was utilised in the case study. Quantitative results mostly appear from the assessment of neighbourhood social sustainability, in which the questionnaire data that takes the largest proportion reflecting social attitudes, in combination with the observation data that investigates neighbourhood-based social interactions. Both the questionnaire and observation results aim to articulate what level of social sustainability the cases are at and what variations occur in the various neighbourhood forms. On the other hand, understanding of planning process is from a qualitative approach**.** The analyses of documents and interviews target to expose the current working scheme on social sustainability and answer the questions of how a socially unsustainable form is shaped and what are the reasons for this. Nevertheless, because separating the mutually related results can not reveal the truths completely, the two types of data will be analysed integrally and mixed in the end.

There is a particular clarification for the two categories of data: population data and sampling data. The first type can directly represent the entire neighbourhood attributes such as crime rate. The sort by sampling, which takes a large proportion in this study, requires a statistical analysis. Its results could represent the populations in probabilities under certain confidence interval levels. In addition, a special explanation is for the 'Likert scale' data, the analysis of which has a hot debate in the literature. The origin of 'Likert scale' was used to examine people's attitudes by ranking orders, for instance, from 'very unsatisfied' to 'very satisfied'. As a result, some studies suggest that its analysis should be mostly treated as ordinal and there was only ranking differences between these orders (Edwards and Edmondson, 2011, Hartley, 2014). However, despite the 'Likert items' themselves are initially designed as ordinal, in practice much research has treated it as interval data (Croasmun and Ostrom, 2011, Maeda, 2014) on which more powerful statistics analytical methods like ANOVA, t-tests can be processed. The using of arithmetic means for measurements can also be accepted under this circumstance. In this study, many indicators

are designed in the form of 'Likert scale'. For example, the perception of 'neighbour mutual helpfulness' was assessed by five Likert items from 'very unhelpful' to 'very helpful'. Despite that each Likert scale item (very helpful) was ordinal, analytical approaches for interval data can still be applied. All these results could then be finally converted into a detailed social sustainability index.

5.5.2 Measuring variances of social sustainability in different forms

The purpose of analysing questionnaire data is to explore the variances of social sustainability among the various patterns of neighbourhood form, which will be repeated for the established thirty indicators. Multiple statistical methods will be applied to analyse the variations and an analytical template can be followed for each indicator. In the beginning, descriptive statistics will be used. Descriptive tables and figures presenting the traits of neighbourhoods and samples will be drawn; the appearance of data distribution and general trends will be exposed. Secondly, variances between groups will be examined. For sampling data, their significance levels on populations also have to be revealed. The data analysis can be mainly processed on the SPSS platform. Different types of statistical methods can be used, depending on the data situation, which can be examined by the Levene's test. Under the homogeneity of data (equity of standard deviation), the one-way ANOVA analysis will be appropriate for analysing the general variations of all neighbourhood groups, meanwhile the Post hoc test is an effective tool to compare detailed differences between each group. If there is a weak homogeneity, the enhanced analytical method such as the Welch F ANOVA test (W-F) and the Games-Howell (G-H) test and will be the alternatives. The above analytical procedure is shown in Figure 5.3.

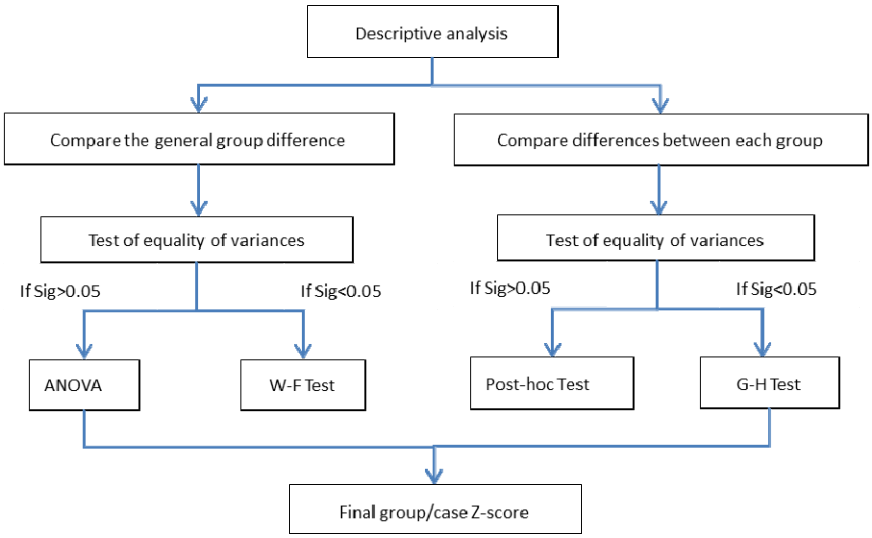

Figure 5.3 Statistical methods applied to analyse social sustainability assessment results by questionnaire

5.5.3 Examining the relationship, correlation and regression analysis

After the comparisons of group variances, a relationship analysis is another vital component that further explores the association between social sustainability and urban form. Correlational analysis, as widely used for quantitative analysis (Punch, 2003), will be the dominant method of examining social sustainability associations with the main variables such as site scale, density as well as some covariates such as building coverage ratio. In this study, the scores of social sustainability indicators are dependent variables, meanwhile the urban form variables are independent. Thus, the correlational analysis will be frequently used to discover the change of the dependent scores on the basis of independent variables. The regression analysis may be further applied, if necessary, to make a prediction on whether there are best-fit models for the potential socio-spatial variations. The correlation and regression can be handled integrally for the variables and indicators to make the relationship examinations more efficient and the outcome more intuitive.

5.5.4 Overall assessment by Z-score and standardisation

In the final phase concluding for the social sustainability appraisal results, the detailed results have to be synthesised and instrumental social sustainability benchmarks have to be generated. Standardisation is necessary, as detailed indicators are assessed by different

methods and outcomes are in wide ranges. The typical z-score method can convert data into a comparable series and amalgamate these indicators together. Finally, numerical rankings for each pattern of the forms will be provided. The visible instrument of radar charts can be effectively utilised to represent the level social sustainability, by which the advantages and disadvantages of each pattern can also be directly observed.

5.5.5 Spatial analysis comparing planning inputs on neighbourhoods and its social outcomes

An extended analysis is designed to associate the social sustainability results outcome with the planning input. The social sustainability appraisal results can be in a crossing contrast with planning and design inputs, which may include spatial characteristics and the key control variables in a selected case study area. For example, external liveability results can be compared with the actual neighbourhood nearby amenities, which are usually illustrated on detailed local plans. Internal liveability and social interaction results could also be connected with the design proposals of neighbourhoods. These targeted analyses could be conducted in more visualised expressions based on the GIS platform and local plans. These socio-spatial coordinative results may effectively reflect the advantages and disadvantages of the current planning implementation and urban governance. Recommendations for planning policy and mechanism could be generated and integrated for both the new development and regeneration of urban neighbourhoods.

5.6 Conclusion

This research has undertaken a case study of the city of Shenzhen and its neighbourhoods to examine the planning inputs and social outcomes. This chapter describes the methods that have been applied during the case study research process. Multiple data collection and analysis methods were organised according to structured research questions. A review of neighbourhood related planning processes was handled at the city level and a core appraisal of neighbourhood social sustainability was implemented at the neighbourhood level. The latter analytical chapters also follow this two-part organisation. Chapter 6 will

report the macro-level planning context of Shenzhen and the selection of neighbourhood cases. The outcome of the neighbourhood social sustainability assessment will be reported in Chapters 7, 8 and 9 using the three-layered structure. All the analyses will be finally synthesised and summarised in Chapter 10 which will lead to a special recommendation for the local planning system and planning processes.

6. MACRO CONTEXT OF SHENZHEN AND THE SELECTION OF NEIGHBOURHOOD CASES

This chapter describes the macro urban context of Shenzhen and the selection of neighbourhood cases. The analysis reviewed the macro-level social sustainable strategies and identified a gap existing in the bottom neighbourhood-level practices. Typical neighbourhood patterns were identified for the next stage case study from a detailed analysis on the spatial characteristics of urban Shenzhen neighbourhoods. The neighbourhood-level case study was launched in the central located Houhai-Denliang area and a pilot study was conducted assessing the social sustainability of local neighbourhoods, in which the survey methods and measurement approaches were tested and improved.

6.1 Macro context of Shenzhen and its planning system

6.1.1 The territory of Shenzhen and urban governance

As an experimental field for the national reform and economic growth (Cartier, 2002, Ma, 2004), the four inner districts of Shenzhen, Luohu, Futian, Nanshan and Yantian, were endowed with '*Special Economic Zone*' (SEZ) status in the 1980s. However, this SEZ boundary triggered unbalanced urban development between inner and outer Shenzhen. Longgang and Baoan used to be the only two outer districts of Shenzhen. Facing the rapid urbanisation and population growth, the public administration and social service in those extremely large regions became powerless and inadequate. As a result, new districts were established in a reorganisation of the territories in 2007. Four new districts emerged after the subdivision of the two large outer districts (Table 6.1). The old SEZ boundary has also been enlarged by the new administrative divisions, and now the 10 districts are all defined as 'urban areas' with the same SEZ preferential policy, which constitute the 1990 km^2 'Shenzhen metropolitan area' (Figure 6.1). Below the district, the next level of urban territory unit is the local 'street office'. As discussed in Chapter 4, it is an extension of administration and executive powers to sub-divided units. Shaped by geopolitical and historical reasons, the boundaries of these street offices are now relatively stable. In total,

there were 57 street offices by the end of 2013 and 32 of them were located in the inner districts. However, the average area covered by a street office is still gigantic, about 34.9 km^2 at the moment.

Table 6.1 The city's total land area, population and density of population in districts

Region	Land Area (sq.km)	Permanent Population * (million)	Density of Population (person/sq.km)
Total	1996.78	10.6289	5 323
Futian	78.65	1.3395	17 031
Luohu	78.75	0.9415	11 956
Yantian	74.63	0.2139	2 866
Nanshan	185.49	1.1191	6 033
Baoan	398.38	2.7038	6 787
Longgang	387.82	1.9447	5 015
Guangming	155.44	0.4964	3 193
Pingshan	167.00	0.3196	1 914
Longhua	175.58	1.4185	8 079
Dapeng	295.05	0.1319	447

* The statistics is from the official census data by the year 2013. Population here means the 'registered population', which refer to people who have registered and lived in Shenzhen over half a year, according to the current demographic system in Shenzhen (Municipal Bureau of Statistics, 2014)

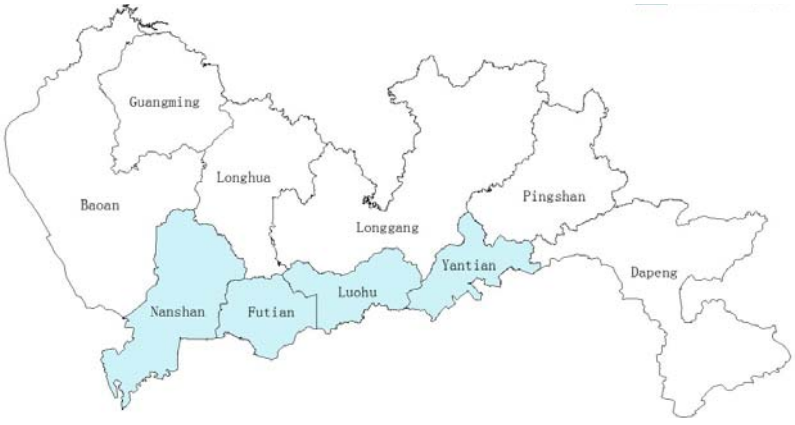

Figure 6.1 The ten administrative districts constitutes a 'Shenzhen metropolitan'

(resource from SUPRC)

The smallest administrative unit in Shenzhen is a community office or station, also called 'shequ' in its original Chinese word (Xu, 2008). It should be noted that an administrative community is **not equal** to a geographic neighbourhood in China, as the former is usually

larger than the latter in terms of the spatial scale and population size. A community office comprising several geographic neighbourhoods is an administration mode commonly seen in the central areas of Shenzhen. Established by the central organisational law in 1990, the key function of a community office is to continue the urban governance system at the bottom scale and provide necessary services to residents, such as population registration (hukou), immigrant management and family and birth control. Whilst community offices used to be relatively small, limited to between 100 and 700 households (P.R.China, 1990), the extraordinary rapid urbanisation process in Shenzhen means that these thresholds have been massively exceeded. By the end of 2012, there were 792 community offices in Shenzhen servicing 10,467,400 populations. On average, one community office covered over a 2.5 km^2 land and had a population of 13,210 (over 5,000 households) to manage. Thus, urbanisation has resulted in community offices being about seven times larger than it was original designed for, and they are often unable to provide sufficient services for their residents and territories. Furthermore, the spatial distribution of these units is extremely uneven. A large community office in an outer district may cover dispersed settlements in a large factory area or a nature reserve place. By contrast, the small ones often appear in inner Shenzhen districts. Here the area of these community offices is usually less than 1 km^2, and includes several populated urban neighbourhoods.

From the above discussion of urban governance in Shenzhen, it is apparent that the administration system is a typical top-down model. It always works at a large scale, including the bottom-level community offices. With the recent rapid urbanisation and population accumulation, the local governance units – the districts, street offices and community offices – have often become overloaded and ineffective in managing space and people within their jurisdictions and thus have to be reconsidered. The recent reorganisation of urban districts in Shenzhen is an example, which confirms this shortcoming. However, there is no action at lower-levels, thus the current governance of urban neighbourhoods may potentially face a similar organisational insufficiency, as urban districts used to experience.

6.1.2 The current hierarchical plans and a lack of neighbourhood-level focus in recent social sustainable development

Shenzhen's local planning system is a typical continuation of the national system (Figure 6.2). A similar planning hierarchy including different levels of plans has been established in Shenzhen, although the previously discussed 'regulatory system' has been locally renamed as 'the statutory plan system' by legislative requirements. The planning administration is executed by the Shenzhen Planning Bureau **(SZPL)**, the formal name of which is the 'Urban Planning and Land Resources Commission of Shenzhen Municipality'. The formulation of governmental plans is technically supported by its subsidiary institution, the Shenzhen Urban and Land Resources Planning Research Centre **(SUPRC)**. During the case study period, the researcher established cooperation with the planners in SZPL and the SUPRC, who often call themselves 'governmental planners'. They are responsible for city-level planning strategies. Detailed plans and regulations for explicit projects are usually specified by the eight branches of SZPL[14], which obey the directives of the SZPL and extend the planning administration to the ten districts.

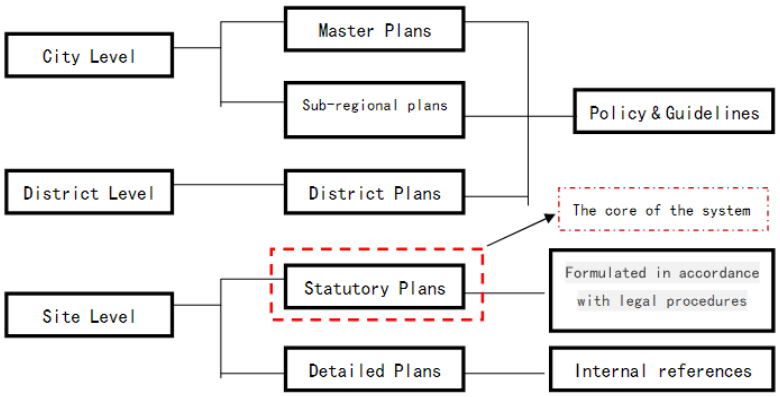

Figure 6.2 The planning system in Shenzhen

(Drawn by the author, according to Du, 2010)

[14] The six branches are: No. 1 branch for Futian and Luohu districts; No.2 Branch for Nanshan district; Binghai branch for Yantian and Dapeng districts; Baoan, Longgang, Longhua, Piangshan and Guangming branches for each of the remaining five districts correspondingly.

At different levels of planning, the issue of social sustainability is receiving increased attention today. The depth and progress of relevant planning policies have been reviewed by this study. Social sustainability has become a new task in most macro-level plans nowadays. It was established as one of the seven core strategies in the 'Shenzhen 2030 report' (Shanghai, 2014). The plan emphasised the significance of 'creating an equal, harmonious and warm social environment' and 'enhancing the cohesion and identification of the city among the public' (Shanghai, 2014, p.38). However, as pointed out by 'Shenzhen City Master Plan 2010' (Shenzhen, 2005), the long-term accumulation of social problems is increasingly becoming apparent and the progress of social development has been lagging behind. In this master plan, social sustainability has been given a specific chapter (Chap. 5). Policies towards 'social harmony' were indicated, such as keeping the population reasonably stable, enhancing public services and improving basic living conditions. Neighbourhood social sustainability is mentioned mostly from high-level housing plans. Housing development was given a special focus in the master plan (Chap. 15). Particularly, it was planned to increase residential land by an additional 23km^2 through both new development and urban regeneration. The growth of total housing spaces and residential space per capita were also mentioned as key housing objectives. In the housing plan 2011-2015 (Shenzhen, 2011a), social sustainability was also emphasised as a priority for promoting urban equity and neighbourhood liveability. Policies (Shenzhen, 2008) are now being promoted to assess urban growth processes and embrace a more balanced multidimensional development, in which environmental capacities are not exceeded, urban lands are saved and social capitals are amplified.

However, issues have occurred during plan implementation, with delivery rarely matching the strategic aspirations. This study has carried out supplementary interviews crossing different SZPL departments and other institutions to understand the real achievements of these strategies. Interviewee B1 suggested that, despite the initial considerations of social developments in the city's master plan, when planning goes down to districts and detailed areas, these things often disappear, with inevitable consequences. According to him, a

typical failure is that many plans have never been fully implemented at the end, which is a real problem not only for the planning system itself but also for the government's inter-department cooperation. As a solution, a new resource management platform should be organised by the higher-level local authority. The low-income housing plan 2011-2015 (Shenzhen, 2011b) also mentioned this issue, with current housing development facing same implementation problems. The duties of the municipal and district divisions are unclear. In practice, while planners are involved strenuously and frequently at the city level, there may be less enthusiasm and initiative among district-level practitioners to implement the upper-level suggested policies, as they would prefer to take their district contexts as the starting point. A lack of cooperation between the planners working at different levels may thus hinder social development by the unintegrated configuration of urban resources.

Two observations can be made from the above discussions. First, the significance of achieving social sustainability within neighbourhoods has been recognised by most plans and interviewees, which have been indicated to be insufficient in Shenzhen. Thus, wider cooperation towards the same goal could be further developed from this foundation. Secondly, despite the recent proposals from city-level strategies, the lack of tangible implementation at local/neighbourhood levels has become a problem. With a top-down nature, proposals towards socially sustainable developments have been recently issued at higher levels in Shenzhen. However, the real implementations of these proposals have met with great resistance at lower-levels especially at the bottom-neighbourhood level, due to the clear planning hierarchy and gaps between different levels of planning. From the neighbourhood perspective, there will be more possibilities in the future to embrace and implement many plans that have been generated at the city level. To achieve real social sustainability, feasible solutions for this bottom scale are even more necessary and important for Shenzhen. However, besides the indications from the analysis of macro-level strategical policies, a system that is more related to the neighbourhood patterns and their sustainability is the micro-level regulatory system in Shenzhen. It focuses on the shaping of urban form and may contain many detailed regulation technologies for key variables. This

system will be particularly discussed in Chapter 10 after a case study of the variations of social sustainability in different neighbourhood patterns (Chapters 7-9) has been explored.

6.2 The spatial features of urban neighbourhoods and a practical classification

An understanding of spatial features of urban Shenzhen neighbourhoods is another important aspect of the case study, which also directly leads to the neighbourhood case selection. First of all, the shaping of neighbourhoods has to be based on the type of residential land. As discussed previously, land use development is the precondition for a neighbourhood development. Two variables, site scale and the FAR, fundamentally determine the physical characteristics of a neighbourhood through their parametric controls of development in both horizontal and vertical directions. The current patterns of urban neighbourhoods can be categorised through a classification based on a combination of these two variables. From an analysis of the number and proportion of each group, the current spatial characteristics of neighbourhood development in Shenzhen can be further explored.

6.2.1 Residential land use for neighbourhoods

At the moment, there is no formal report or actual statistics on the number of urban Shenzhen neighbourhoods. A spatial analysis was further undertaken in this case study using the collected GIS data. Urban neighbourhoods were further extracted by the land use main code 'R'. The land use system in Shenzhen similarly adopts the national codes (Ministry of Construction, 1993); the types of residential land use are categorised as R1, R2, R3 and R4. The overall city-level land use comprising the four sorts is shown in Table 6.2. The distribution of each type of land use can also be extracted and solely presented on the entire city GIS platform (Appendix Figures 2.1-2.2).

The group R1 refers the low-density low-rise housing, which, however, is only in a small proportion in Shenzhen at present and no longer encouraged in local planning practice. The R2 group is the dominant type as it consumes the largest areas of residential land and

accommodates the largest volume of urban neighbourhoods (Table 6.2). A development in the R3 type could be accepted as an equivalent urban neighbourhood according to the local planning practice. Low-quality housing used to occur under this type of land use. It has been redeveloped recently, although the support from nearby amenities and infrastructures may still need to be improved (Shenzhen, 2011b). Both R2 and R3 are specifically developed for commodity housing use via similar land sale and planning processes. The last group, R4, particularly refers to the urban village and some similar temporary constructions in Shenzhen. Although currently taking a large proportion (Table 6.2), as stated in Chapter 2, an urban village has been suggested not to be an eligible neighbourhood. Thus, the categories of R1 and R4 were deleted in the process of analysing urban neighbourhoods, because they were both irrelevant to the research focus. Further filtrations and rectifications on R2 and R3 results were taken in order to enhance the data accuracy. For example, a few parts (R22, R32) were deleted, which were separate development of residential facilities without a housing land use. Finally, the valid urban Shenzhen neighbourhoods are the remaining 5,581 units on the GIS platform (Appendix Figure 2.3).

Table 6.2 A statistical analysis on Shenzhen's residential land use 2013

Land use Type	R1	R2	R3	R4
Total number of development	138	5581	769	2324
Total land use area (km^2)	5.99	112.00	10.73	49.68

6.2.2 A practical classification of urban form and a review of the current spatial characteristics

No formal classification was given for neighbourhood patterns either by the current planning system or by relevant studies. The topology method was adopted for the above-identified 6,152 neighbourhoods. A form-based classification has to set up independent variables and the interval values for each variable, by which neighbourhood attributes can be regrouped and filtered. After reviewing the urban form regulations, the two chosen independent variables are site scale (SS) and built-up density (FAR). The spatial feature of any urban development can be represented both horizontally and vertically.

The interval values of 'SS' and 'FAR' are determined by the current urban form regulations (Figures 6.3 and 6.4). The local planning regulation (Municipality, 2013) defines the basic site-scale interval as 1 hectare. The SS value below the watershed of 1 ha presents the type of 'small-scale neighbourhood'. There are two sub-groups: the 'small I' ranges between 0.7 and 1ha, and the 'small II', which is no more than 0.7ha, is the extra-small pattern. The medium scale ranges, between 1ha and 5ha, can again be further divided into 'medium I' (1-2ha) and 'medium II' (2-5ha). A large neighbourhood arises when its scale exceeds 5ha and the 'large I' (5-10ha) and 'large II' (>10ha) patterns can be additionally categorised by the dividing point of 10ha. From the above discussion, it can be seen that all neighbourhoods can be eventually classified into three main categories and six sub-categories.

The overall neighbourhood development scales in Shenzhen (by 2013) are shown in Figure 6.5. Taking about 53.6% in all, the medium-scale neighbourhood development was the dominant model. However, a large proportion of small-scale neighbourhoods was also noticeable (Figure 6.5). In contrast, large development type accounted for no more than 10% of the total number of neighbourhoods in 2013. The proportions of the six sub-categories can also be seen in Table 6.3: 27.6% of neighbourhood projects had adopted the extra-small pattern with a no more than 0.7 hectare base as their development scale. This indicates that the present urban form of Shenzhen may have become very fragmented with the rise of small-scale development. However, little attention has been paid to this spatial change and this research is particularly interested in the real motivations and consequences of dividing a large site into small pieces and applying separate development approaches.

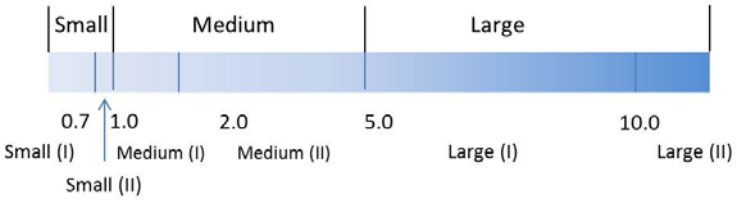

Figure 6.3 The coordinate of the variable site scale

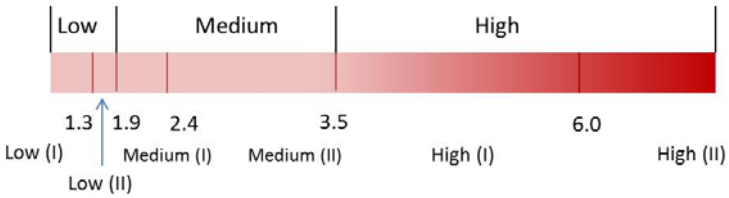

Figure 6.4 The coordinate of the variable FAR

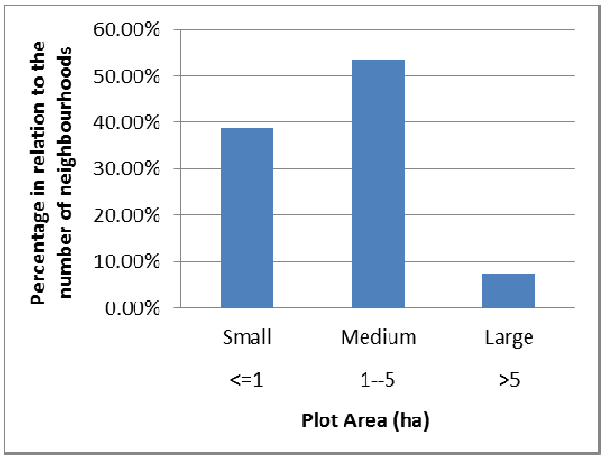

Figure 6.5 The overall site scale status for Shenzhen neighbourhoods (by 2013)

Table 6.3 Shenzhen neighbourhoods classified by the variable site scale

Group	Sub-group	Site Scale range (ha)	Number	Proportion
Large	Large (II)	>10	90	1.46%
	Large (I)	5-10	379	6.16%
Medium	Medium (II)	2-5	1733	28.17%
	Medium (I)	1-2	1564	25.42%
Small	Small (II)	0.7-1	686	11.15%
	Small (I)	<=0.7	1700	27.63%
	Total		**6152**	**100%**

A similar approach was applied to the variable 'FAR', by which another classification of neighbourhoods was made (Figure 6.4). The criterion for deciding the intervals of FAR is also drawn from the relevant planning policies (Shenzhen, 2013, Ministry of Construction, 1993). A low density is defined as FAR<1.9. There are two types of development in this group. Usually, neighbourhoods in a typical multiple-storey pattern, which were largely built in the 1980s and 1990s, have a FAR ranging between 1.3 and 1.9 (Low II). The low-rise houses or villas are often designed in a low density below 1.3 FAR (Low I). However, nowadays these two forms seem to be no longer prevalent in Shenzhen. For the medium density, the value of FAR is between 1.9 and 3.5, in which 'medium I' (1.9-2.4) and 'medium II' (2.4-3.5) could

also be sub-divided. The medium I and medium II may be from an intensified mid-rise development or a mixture of the mid-rise and high-rise modes. A high-density development (FAR>3.5) is often solely shaped by a single high-rise building or several organised as a cluster. Urban density has been strengthened dramatically in China (Yang and Chen, 2005) and the high (I) pattern (FAR 3.5-6.0) now can be commonly seen in many places in Shenzhen. Although the local planning system suggests that the residential FAR should be no higher than 6 (Municipality, 2013), some newly developed projects have, via some ways, exceeded this controlling value in practice and brought in a super-high pattern (High II).

This study also noticed that the density data on SZPL's GIS platform was incomplete because of the partially visible FAR information. Only the newly planned 3256 neighbourhoods could be categorised. This was because the platform was established after 2000, alongside the current statutory plan system. For the remaining 2898 neighbourhoods that were planned before 2000, the related local plans only described their density attributes as 'preserving the current FAR' (Municipality, 2009). Without a detailed calculation of the FAR values within the enhanced platform, a manual FAR calculation for the remaining thousands of neighbourhoods would be extremely difficult. Hence, the density analysis here only displays the feature of urban Shenzhen neighbourhoods after the year 2000 to describe the recent development tendencies.

Figure 6.6 shows the overall density situation of urban Shenzhen neighbourhoods built after 2000. It is apparent that the medium-density form was the dominant one with reference to its largest proportion (62.13% in total number). The proportion of low-density (18.95%) and high-density (18.92%) neighbourhoods was almost equal. However, it could still be inferred that the high-density neighbourhoods had increased recently, as the previous neighbourhood development before 2000 mostly adopted medium and low densities in practice (Tang and Fu, 2003). Table 6.4 also gives detailed proportions for the six sub-categories. The super-low density pattern (low I) appeared to be lowest in number. Another type of low-density development (low II), usually in multi-storey, which was a

leading pattern in the 1980s and 1990s (Worldunion, 2003), only took 14.59% of the total by 2013. An almost equivalent proportion (14.16%) was from the high-density group (high I, FAR 3.5-6.0), which has been observed to have experienced continuous growth since 2000 (Tang and Fu, 2003, Shenzhen Municipal Bureau of Statistics, 2013). Moreover in the medium density group, the amount of the medium-high pattern (medium II, FAR 2.4-3.5) was significantly larger than the medium-low pattern (medium I, FAR 1.9-2.4). Generally speaking, Shenzhen's neighbourhoods have become more dense since 2000.

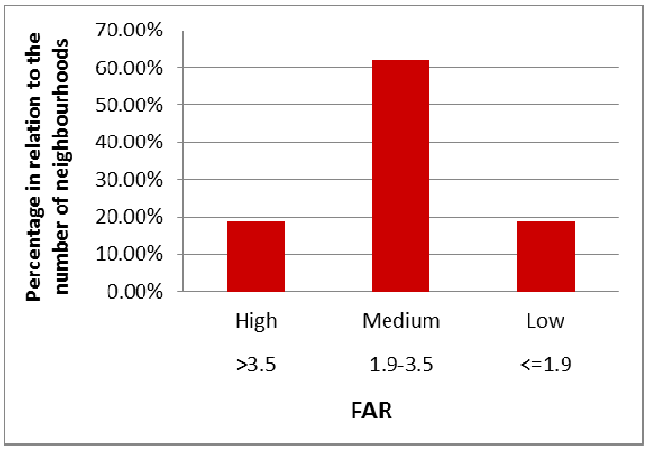

Figure 6.6 The overall 'FAR' status for Shenzhen neighbourhoods (2000-2013)

Table 6.4 Shenzhen neighbourhoods classified by the variable FAR*

Group	Sub-Group	FAR ranges	Number	Proportion
High	High(II)	>6.0	155	4.76%
	High (I)	3.5-6.0	461	14.16%
Medium	Medium (II)	2.4-3.5	1427	43.83%
	Medium (I)	1.9-2.4	596	18.30%
Low	Low (II)	1.3-1.9	475	14.59%
	Low (I)	<=1.3	142	4.36%
	Total		**3256**	**100%**

***FAR statistics is partial as the GIS platform only includes the neighbourhoods planned after 2000

In a combination with the previously revealed variations in scale, the recent trends of urban development in Shenzhen are clear: the 'fragmented' and 'intensified' modes have greatly appeared. The trends at the two directions (horizontal and vertical) are sometimes associated and could simultaneously happen in a neighbourhood development. To better understand the above spatial characteristics, typical urban form patterns have to be used in the case study. Along such an analysis, the real patterns of neighbourhoods can be further

identified. There are nine major categories according to the combinations of different scale and density groups. Thirty-six sub-divided types of neighbourhood patterns may even exist if all sub-divisions are taken into account. However, this research can only focus on certain typical patterns. As indicated above, the medium-ranged groups are still the dominant types among newly developed neighbourhoods, which include both the medium scale and medium density. Thus, the neighbourhood-level case study has to give a particular focus on these. However, there are also some other patterns that need to be explored regarding recent spatial changes.

Table 6.5 Identified neighbourhood patterns in Shenzhen (built after the year 2000)

Group	Site scale (ha)	FAR	Number	Proportion (number)
LSLD		≤1.9	77	2.36%
LSMD	>5	1.9-3.5	156	4.79%
LSHD		3.5-6.0	21	0.64%
MSLD		≤1.9	337	10.35%
MSMD	1-5	1.9-3.5	1291	39.65%
MSHD		3.5-6.0	270	8.29%
SSLD		≤1.9	203	6.23%
SSMD	≤1	1.9-3.5	550	16.89%
SSHD		3.5-6.0	351	10.78%
	Total		3256	100%

Table 6.5 shows a classification for the typical patterns of new neighbourhoods developed between 2000 and 2013. Firstly, the medium-scale medium-density (MSMD) pattern took the large proportion among all these neighbourhoods (39.65%). Secondly, as stated in Chapter 3, the large-scale low-density (LSLD) pattern is not the concern of this research due to its low level of efficiency in using urban land. Large-scale high-density (LSHD) developments are rarely adopted in practice, as can be seen from Table 6.5. This pattern is only 0.64% of the total. In terms of the spatial distribution, it can be seen that large-scale development mainly took place in outer Shenzhen within this period, and its most typical pattern, the large-scale medium-density (LSMD) neighbourhood, was apparently unpopular in the city core (Appendix Figure 2.4). Recently, small neighbourhood projects have become more popular. Many of them were designed in the patterns of small-scale medium-density

(SSMD) or small-scale high-density (SSHD). The latter was found to be extremely prevalent in inner districts of Shenzhen (Appendix Figure 2.5).

However, what are the real social lives of residents under these spatially varied neighbourhood patterns? In addition to the most commonly seen pattern, MSMD (illustrated above), selecting the medium-scale low-density (MSLD) and medium-scale high-density (MSHD) is also important; combined with MSMD, they can together enable a full exploration of the impact of variable density on social sustainability with the control of variable site scale. The researcher is also curious to understand the level of social sustainability for the pattern of LSMD, the most typical one of large-scale developments but not being used often nowadays. Although the number of SSHD pattern is less than the SSMD at present, the frequent appearance of SSHD especially in inner districts still motivates the researcher to evaluate its real level of social sustainability, especially when recognising the current rising trend of high-density development in Shenzhen.

From further analyses of the spatial distributions across different areas, it is clear that the dynamic of new-era neighbourhood development in Shenzhen has an additional trend of intensifying its inner areas and creating urban fragmentation. This result may differ from some studies' expectations (Cartier, 2002, Tai, 1986), which indicated its urban growth pathway as a larger development in the outskirt and a decentralisation of its inner districts. The relocation of housing in the suburb where there are more available spaces has not necessarily inhibited the transformation of the inner core. The increased density can be seen as a visible result of the recent urban transformation. However, the reduced scale of development may also be another concealed consequence under the great competition for housing land. However, a shrinkage in site scale for development could increase spatial fragmentation and lead to more varied neighbourhood patterns. A question is thus raised about whether these rising new developments are sustainable solutions, despite the fact that they could increase local housing opportunities.

In summary, little attention has been paid to the vast spatial transformations in urban Shenzhen neighbourhoods. The real degrees of social sustainability of many neighbourhood patterns have not been carefully examined and are very unclear at present. This may also reveal issues inside the local planning mechanisms. A reflection on current planning policies could be made, for instance, the wide utilisation of the SSHD form and the increased spatial fragmentation in recent urban development. Thus, a targeted neighbourhood-based investigation is justified.

6.3 The neighbourhood-based survey

6.3.1 Local neighbourhood networks and the case selection process

Significant differences still exist between the inner and outer areas and thus the neighbourhood development is uneven. In inner Shenzhen, most neighbourhoods are the 'urban' type, with stable boundaries and mature amenities. By contrast, in the outer districts, new housing projects are in progress; meanwhile, massive rural villages have been transformed into an urban type. Distinguished by the old SEZ line, this kind of 'two scenes' characteristic is apparent in Shenzhen (Zhu, 1996, Tang and Fu, 2003). Because of a large amount of immature urban neighbourhoods, outer Shenzhen has not been considered a suitable area for neighbourhood case study selection, as the neighbourhoods are halfway products between the urban and rural. Neighbourhoods from inner districts are therefore more appropriate because they are urban-based settlements and under typical urban governance. Furthermore, the implementation of the local planning system in core areas of Shenzhen is more typical, and systematic regulations of urban form have been applied in inner-district planning units for years.

Local sustainable development strategies have greatly encouraged the development of public transportation, especially the subway system (Shanghai, 2014, Shenzhen, 2005). By the end of 2013, five subway lines had been the opened, which enable rapid connection between the core residential, business and commercial areas (Figure 6.7). Another 13 metro lines and several intercity railways are under construction or have been planned (Figure 6.8).

The existing routes have a strong connection with prime urban residential areas. In the other words, from its networks, the current metro system also indicates the potential locations of neighbourhoods and thus greatly helps to narrow the research to appropriate cases.

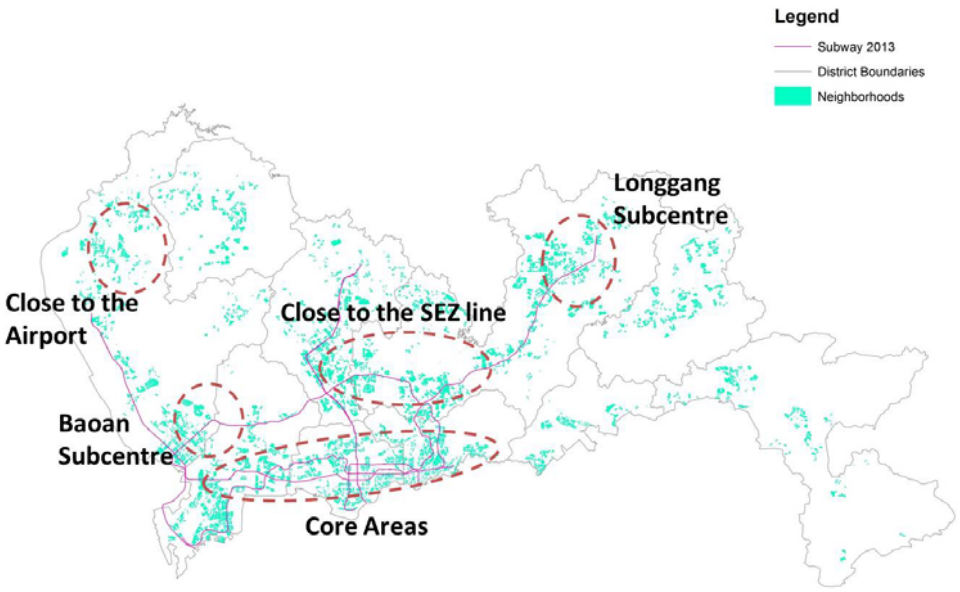

Figure 6.7 Shenzhen's subway network 2013 has already covered the core residential areas

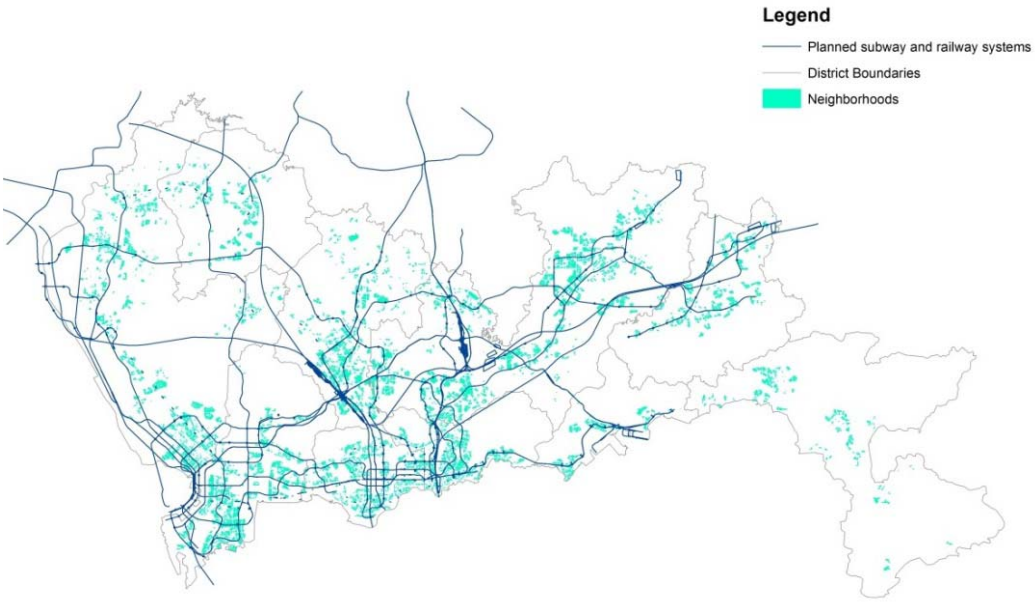

Figure 6.8 The increasing improvements for neighbourhoods' accessibility and connectivity according to the plan for Shenzhen's subway and railway system

(Figures 6.7-6.8 drawn by the author, resource from SUPRC)

However, the identification of cases has to foresee other factors. Different locations, road connectivity and surrounding environments may cause varied social sustainability results (see for example, Chan and Lee, 2008, Cuthill, 2010, Brown and Barber, 2012). As the hypothesis is to examine the key effect of urban form, the selection of cases has to limit the impacts from non-form variables. This requires the researcher to observe potential factors in advance and judge the rationality of the potential cases at the beginning. Subsequently, a filtering process also helps to identify suitable cases. The accessibility to local neighbourhoods and their information also needs to be considered as a practical issue for selecting cases.

6.3.2 Neighbourhood case study: Houhai-Dengliang, Nanshan District

Located in the South near the Shenzhen Bay and the border between the Mainland and Hong Kong (Figure 6.9), the Houhai-Dengliang area is one of the most well established living places in Shenzhen after many years of development. Located on both sides of the Dengliang Road, ten different neighbourhoods are symmetrically distributed as two large blocks (Figure 6.10), which are all within a walking radius of the metro station 'Dengliang'. As a half of a statutory planning unit (Ref. NS01-02, Appendix Figure 2.6), this case study area has a total population of 7887 households and a land area of 45.6 hectares. According to the local governance system, these neighbourhoods are managed by two administrative community stations CS1 Weilan hai'an (Ref. 440305007019) and CS2 Minghai (Ref. 440305007016). The boundaries of the two communities are illustrated in Figure 6.10. As stated in Chapter two, the dual operation of the planning and governance systems is a typical phenomenon in Chinese cities including Shenzhen.

Figure 6.9 The location of Houhai-Dengliang in Nanshan District

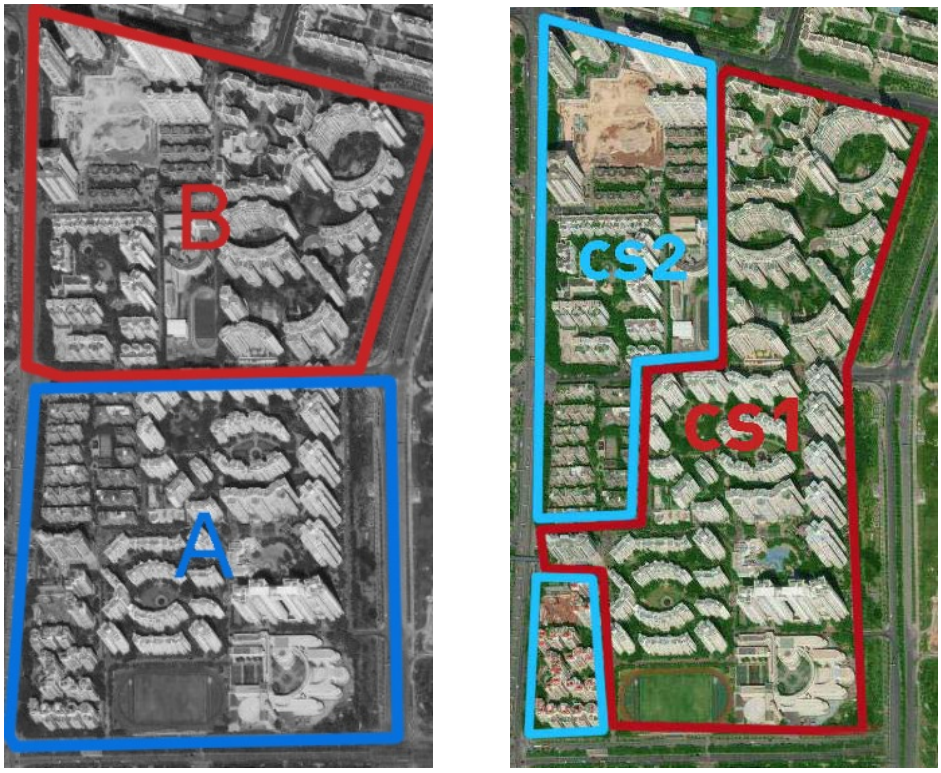

Figure 6.10 The boundaries of the two urban blocks and two community offices

(drawn by the author resource from online Google satellite maps)

The selection of Houhai-Dengliang (HD) area as the final case is based on four reasons. Firstly, the Nanshan District where HD is located is a core developed residential area in Shenzhen. Continuous housing development started from the 1990s. In the city master plan of 2010, this area was defined as a core residential function with an expanding trend to the east side of Shenzhen Bay through new land reclamation (Shenzhen, 2005). Secondly, many typical forms can be found in this area. The HD includes different neighbourhoods in terms of scale and density; the entire fabric is also challenged by their mixture and fragmentation. Thirdly, its spatial structure is explicit, equal, and easy to analyse. There are no disturbances

from business, manufacturing or other types of land use. The HD area is an entirely residential area comprising two blocks that are mostly symmetrical. Fourthly, the local planning policies can be better reviewed when neighbourhoods are regulated in a planning unit, as they follow the same regulations of land use and public amenities. The external factors of neighbourhoods are thus similar, such as location and transportation. Moreover, the accessibility of the planning information also makes the investigation operable. In summary, the HD is a typical case representing urban Shenzhen neighbourhoods as well as the local planning process.

An urban form analysis was initially taken for on each coded plot of the HD area before the implementation of the case study (Figure 6.11). The south side of this area, coded as HD-A, comprises three neighbourhoods, A1, A2 and A3. The north side of HD, defined as HD-B, has seven neighbourhoods and is thus more fragmented. Although the neighbourhoods A1 (Cote D'Azur 1) and B1 (Cote D'Azur 2) have close relationships because of the same developer, they are still recognised as two different neighbourhoods, considering their separate organisation by two resident committees and being split by a main road. Two sites in this area (A4 and B6-2) are still under development and are not considered as effective cases. A primary school and a high school are located in this area with independent plots. Other necessary facilities are embedded into the neighbourhood via mixed-used developments.

The ten urban neighbourhoods in HD take a variety of different forms (Appendix Figure 2.7). However, in reality, they can be categorised into five patterns (Table 6.6). As stated previously, these patterns are from the popular combinations of the variable site scale and FAR ratios. A re-coding of neighbourhoods by their form categories is further applied (Appendix Table 2.1) and these codes will continually be mentioned in the analyses afterwards. Among these neighbourhoods, medium-scale patterns take the largest proportion: the MSMD, MSHD and MSLD are all in the range of 1-5 hectares. Their variation mainly comes from the density. The FAR value of the MSHD group is over 3.5. The MSMD group’s density range is between 1.9 and 2.4. For the form pattern MSLD, the value of FAR is below 1.9. In general, the SSHD pattern is easily visible in this area through the several super high-rises built on small sites. In contrast to the MSHD, the SSHD has a super-high FAR value (over 7.0) and is very distinctive from other forms. This also indicates that control of high-density development would be problematic, as in reality these developments did not

fully comply with the suggested regulations. The LSMD pattern is in a noticeably large scale and medium density ranges (SS from 5 to 13 hectares, FAR between 2.4 and 3.5); its population is also much larger than the others. According to the previous city-level urban form analysis, these typical forms are commonly seen throughout the entire Shenzhen metropolitan region. Thus, it can be argued that the Houhai-Dengliang area represents the typical patterns of the whole city's neighbourhood development. The issues in relation to planning and development processes could also be reflected via this case.

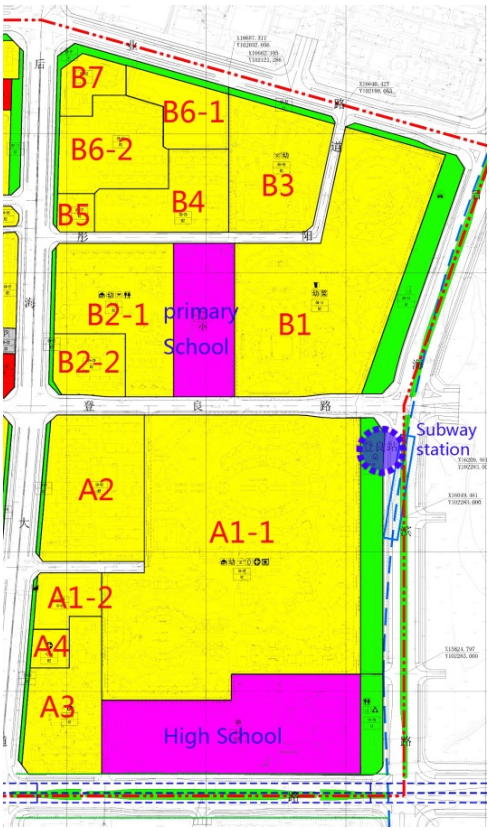

Figure 6.11 The coded neighbourhoods in the HD area

Drawn by the author, extracted from the statutory plan (Municipality, 2009)

Table 6.6 The summary of the numbers of cases

Urban Form	LSMD	MSHD	MSMD	MSLD	SSHD
Case Number	2	2	2	2	2

The core controlling variables of urban form, which have been discussed previously in Chapter 3, include key variables of SS (site scale), and FAR (density) as well as covariates BCR (building coverage ratio) and Dp (population density). Here, no direct correlation is found between site scale and FAR (Table 6.7, r=-0.358, p=0.31), which are both identified as independent variables. Pearson's correlation results suggested some mutual relationships between other covariates, which also needs to be clarified. As discussed in Chapter 3, FAR is usually associated with the population density (Dp). In the HD case study area, this association is evidently found as very strong (r=.942, p=0.000). Hence, the high-density

development, which is in fact based on the features of the built environment, could also, to a large degree, indicate the degree of social crowdedness. There is a strong, negative correlation between building coverage ratio (BCR) and site scale (SS) (r=-.652, p=.041); meanwhile, a strong, positive relationship exists between BCR and FAR (r=.799, p=.006). As a result, both high-density and small-scale developments are inclined to lead to a higher building base coverage in real neighbourhood development. As a consequence, the provision of available neighbourhood outdoor sites could be reduced. This means the real planning implementations at the local bottom-scale could be greatly different from the theoretical discussions, which assumed that BCR would decrease with the increase of FAR under the national standard (see section 3.3.4 in Chapter 3). It can be explained that the building coverage ratio may be less significantly considered in Shenzhen's real urban form creation process, and is usually determined after the configurations of site scale and FAR by neighbourhood designers without a restricted control.

Table 6.7 The associations between urban form variables, from a Pearson's Correlation

		SS	***BCR***	***FAR***	***D_P***
SS	Pearson's correlation	1	-.652*	-0.358	-.398
	Sig. (2-tailed)		.041	.31	.254
BCR	Pearson's correlation	-.652*	1	.799**	.888**
	Sig. (2-tailed)	.041		.006	.001
FAR	Pearson's correlation	-.358	.799**	1	.942**
	Sig. (2-tailed)	.31	.006		.000
D_P	Pearson's correlation	-.398	.888**	.942**	1
	Sig. (2-tailed)	.254	.001	.000	

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).

Abbreviations. SS: site scale; BCR: building coverage ratio; FAR: floor area ratio; Dp: density of population.

6.3.3 A pilot study for the social sustainability assessment

The research design requires social sustainability to be examined among different patterns of neighbourhoods. A pilot study was carried out during the neighbourhood survey phase in order to test the survey design and assure consistency in the measurement of the survey results. All the methods designed in Chapter 5 were examined, which include interviews, observations and questionnaires. Some survey contents were improved following the pilot survey. The notion social sustainability, which is even ambiguous and confusing in academic research, was reported by residents as too difficult to understand. The way in which the questions for the interviews and questionnaires was expressed was improved by using plain words in both written and verbal deliveries in order to keep them simple and clear from the respondents' perspective (Creswell, 2009a). In the first-round observation and

questionnaire, the researcher discovered that interviews needed to be conducted at the beginning of each case. A considerable number of participants who were able to provide useful information and willing to take part in further discussions were recommended by the local community stations, neighbourhood committees or neighbourhood management agencies. The next three chapters will discuss the neighbourhood-level survey in which the questionnaire, observation and interview methods are all utilised (Table 6.8).

Table 6.8 A summary of neighbourhood social sustainability indicators and the corresponding methods

Theme	Indicator	Questionnaire	Observation	Document
1.1 External Liveability	1.1.1 Satisfaction with educational facilities	√		
	1.1.2 Satisfaction with healthy facilities	√		
	1.1.3 Satisfaction with commercial facilities	√		
	1.1.4 Satisfaction with cultural facilities	√		
	1.1.5 Satisfaction with welfare facilities	√		
	1.1.6 Satisfaction with public transport	√		
1.2 Internal Liveability	1.2.1 Satisfaction with public space	√		
	1.2.2Satisfaction with inner surroundings	√		
	1.2.4 Satisfaction with sports facilities	√		
	1.2.5 Satisfaction with parking spaces	√		
2.1 Social Cohesion	2.1.1 Sense of belonging	√		
	2.1.2 Neighbourhood character & distinction	√		
	2.1.3 Neighbour mutual recognitions	√		
	2.1.4 Neighbour mutual helpfulness	√		
	2.1.5 Social group membership	√		
2.2 Social Interaction	2.2.1 Frequency of outdoor activities		√	
	2.2.2 Spatial Intensity of outdoor activities		√	
	2.2.3 Strength of social activities		√	
	2.2.4 Daily time spending on neighbourhood activities	√		
	2.2.5 Willingness to participate in social activities	√		
3.1 Neighbourhood Safety	3.1.1 Occupancy stability			√
	3.1.2 Population stability			√
	3.1.3 Crime rate (Objective safety)			√
	3.1.4 Perceived safety	√		
3.2 Neighbourhood Governance	3.2.1 Satisfaction with property management	√		
	3.2.2 Satisfaction with community service	√		
	3.2.3 Participation in property management affair	√		
	3.2.4 Participation in committee affair	√		
	3.2.5 Neighbourhood self-governance	√		
	3.2.6 Neighbourhood mutual collaborations	√		

Data and the type of measurement of these indicators were also tested and improved in the pilot study. As being arguable in the literature (Olsen, 2011, Castree et al., 2013), the measurement of social attitude can adopt different ways and data types. An appropriate way had to be worked out for these neighbourhood surveys. Many social attitude indicators in this survey are designed using a 5-point Likert scale (Appendix 1). However, the pilot study also compared different ways for assessing certain indicators. For example, to evaluate the participation in social groups, Likert data was originally designed with options such as very rare, rare, average, frequent and very frequent. However, this classification was subjective and even inaccurate. From a trial in the pilot study, the researcher also found a practical difficulty that responders did not know whether joining one group meant 'frequent' or 'average'. Thus, the interval scale measurement was adopted finally instead and participants were suggested to report their social group memberships numerically. Similarly, the actual number of recognised neighbours and daily time spent on activities were requested in the assessments of neighbour mutual recognition and willingness to participate in neighbourhood activities.

6.3.4 The demographical feature of respondents in the questionnaire survey

A total of 226 valid responses were received to the survey from neighbourhoods of the HD area, which could also be further classified into five patterns by their neighbourhood forms (Appendix Table 1.1). The overall response rate of the questionnaire survey was 59.5%. The demographic features of participants are listed in Table 6.9. The gender categories are almost equal: male (47.8%) and female (52.2%). In terms of household members, the 'three-member' mode accounts for 42% of participants. In addition, there is a large proportion of participants (37.2%) living with 4 or 5 members together. Solo inhabitancy rate is low (4%). For the feature of population ages, the middle-aged group (36-45) takes the largest proportion (40.3%). Consistent with the ageing tendency of the urban population in China (Feng et al., 2012, Chen and Powell, 2012), 21.2% of the sampling population are elderly (over 55). Furthermore, middle-young aged people (26-35) count for 20.4%. Most of the participants have received a decent education: 28.8% of them have received college-level training and 42.9% of them have received undergraduate and postgraduate levels of education. The proportion of low-educated participants (under the high school level) is small (6.2%). In terms of the income level of respondents (Individual monthly), 29.6% of respondents are at the level of medium-low income (3000 to 6000 CNY). The medium and medium-high income groups (income range between 6000 and 15,000 CNY) together

count for 35%. The proportion of high-income (15,000 CNY or above) participants is 18.1%; meanwhile, the percentage of low-income ones is 17.3%. No obvious income polarisation was found in the survey among the 226 participants. Remarkably, these demographic variables are mutually associated with each other (Table 6.10), for example, the negative correlation between age and education (R=-.443, p=.000), and the positive association between income and education (R=.533, p=.000).

Table 6.9 Demographic features of participants

Demographic variable	Category	N	Percent
Gender	Male	108	47.8
	Female	118	52.2
Age	18-25	4	1.8
	26-35	46	20.4
	36-45	91	40.3
	46-55	37	16.4
	56 or above	48	21.2
Household (Hh) Member(s)	1	9	4
	2	31	13.7
	3	95	42
	4	40	17.7
	5	44	19.5
	>5	7	3.1
Education	Primary school or less	1	0.4
	Middle School	13	5.8
	High school	50	22.1
	College	65	28.8
	University	76	33.6
	Master or above	21	9.3
Individual monthly income (CNY) Note: 1,000 CNY = approximately 100 GBP, based on the current exchange rate	Low (below 3,000)	39	17.3
	Medium-low (3,000-5,999)	67	29.6
	Medium (6,000-9,999)	37	16.4
	Medium-high (10,000-14,999)	42	18.6
	High (15,000-19,999)	26	11.5
	Elite (20,000 or above)	15	6.6

Table 6.10 The correlations of the demographic features of participants

	Spearman's rho	Age	Hh Member	Income	Education
Age	Correlation Coefficient	1	.282**	-.363**	-.443**
	Sig. (2-tailed)	-	.000	.000	.000
Hh Member	Correlation Coefficient	.282**	1	-.196**	-.152*
	Sig. (2-tailed)	.000	-	.003	.023
Income	Correlation Coefficient	-.363**	-.196**	1	.533**
	Sig. (2-tailed)	.000	.003	-	.000
Education	Correlation Coefficient	-.443**	-.152*	.533**	1
	Sig. (2-tailed)	.000	.023	.000	-

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

A middle-class-based new Chinese neighbourhood paradigm can be observed from the above introduction to the physical patterns and demographic features of the Houhai-Dengliang area. This is first because the education level of residents is noticeably high, as over half of the respondents have received higher education. Second, the population structure is relatively stable in terms of property ownership and floating population. There will be a detailed discussion on neighbourhood stability in Chapter 9. Last but not the least, most neighbourhoods in this area have been developed for over 10 years, so potential for socially sustainable development can be found in their mature governance and preliminary self-identity. These features can be commonly found in most mature urban neighbourhoods in inner districts of Shenzhen (Li and Wang, 2007). However, this pattern may not be able to represent some developments in the suburbs. This is due to the uneven structure of the city and the dual urban-rural system, which have been discussed at the beginning of this chapter. In conclusion, this case study is a portrait of a typical new Chinese neighbourhood pattern. The outcome of the case study can be extrapolated to many Chinese cities where urban neighbourhoods are reshaped as a result of the nationwide similarities in the housing market and planning system in the past two decades.

6.4 Conclusion

From the proposed macro-level strategies, the pursuit of social sustainability seems to have been initially embedded in Shenzhen. However, from an investigation of the real practices and effects, many upper-level planning strategies have not been fully implemented in lower-level developments, especially with respect to the bottom-scale neighbourhoods. Despite the establishment of a centralised system, the top-down operation of statutory plans still has a number of limitations. The discussed planning and governance mechanisms have provided general macro contexts for a deeper understanding of the urban form shaping and neighbourhood development processes in local planning practice. From a macro-level analysis of the spatial characteristics of urban neighbourhoods, fragmented and often more intensified neighbourhood developments are typical consequences of the rapid urbanisation that has happened in Shenzhen. The real social sustainability levels of some of these neighbourhood patterns seem to be questionable but should be further evidenced from an empirical appraisal. The next three chapters will report the outcome of the neighbourhood-level case study and a focus on the real level of social sustainability of these neighbourhood patterns. A thorough discovery of the socio-spatial linkages and recommendations to planning mechanisms can be generated based on these findings.

7. SOCIAL SUSTAINABILITY APPRAISAL: THE LAYER OF 'BASIC NEEDS'

The first layer of neighbourhood social sustainability, the 'basic needs' was assessed by the questionnaire survey conducted in the Houhai-Dengliang area of Shenzhen. This chapter first reports the appraisal results. The general outcome of the entire HD area and the variations between the neighbourhoods are both addressed. Statistical analyses have been additionally performed to examine the reliability of the data. The nexus between the social outcome and planning input is especially discussed, in which the current strengths and shortages of the local planning system are discovered.

7.1 Introduction to data, measurements and variables

The layer of 'basic needs' is the ground of the social sustainability assessment that was established in Chapter 4. It basically discusses the liveability of urban neighbourhoods through a person-based characteristics to understand the behaviour-related function of the neighbourhood (Vine et al., 2012). Neighbourhood external amenities is one key component including educational facilities, health facilities, commercial facilities, social welfare facilities and cultural facilities. Another part is the satisfaction with neighbourhoods' public space and inner surroundings and sports facilities/playgrounds which are identified as internal factors of neighbourhood liveability in Chapter 4. The remaining part is the satisfaction with nearby transportation, which is mixed with the external accessibility to public transport and internal availability of car parking spaces. The data used in assessing the layer of 'basic needs' were collected by survey questionnaires, in which ten indicators for assessing the layer of 'basic needs' were designed. The value of each dependent variable (Table 7.1) was measured by the level of social satisfaction using the 5-point Likert scale method. Respondents were asked to indicate how satisfied they were with the designated amenities and facilities from extremely unsatisfied (1) to extremely satisfied (5). Totally there were 226 valid responses to the survey. As described in Chapter 6, the local neighbourhoods could be further classified into five different patterns according to their spatial characteristics.

7.2 The 'basic needs' appraisal result for the entire research area

The appraisal result of the entire HD area is shown in Figure 7.1. A general decent level of social satisfaction of basic needs was recorded, as eight indicators out of the ten have

received a positive result (M>3.0). However, tested by repeated measures in the ANOVA test with a Greenhouse-Geisser correction (Appendix Table 4.2), variations between these indicators were still significant (F= 84.689, p=0.000). Firstly, there were remarkably high-levels of satisfaction (M>4.0) with the educational facilities (M=4.01, SD=.808), commercial facilities (M=4.07, SD=.899) and public transportation (M=4.2, SD=.778), which were all significantly higher than other remaining indicators in the pariwised comparisions by the Post hoc tests (p=0.000, Appendix Table 4.2). Secondly, the satisfaction with health facilities (M=3.66, SD=.905), cultural facilities (M=3.40, SD=1.003), sports facilities (M=3.08, SD=1.221), public spaces (M=3.32,SD=1.183) and inner soundings (M=3.46, SD=1.144) were also generally positive (M>3.0) and significantly higher than the remaining two, social welfare facilities and car parking space. Social welfare facilities (M=2.85, SD=1.032) received a pronouncedly low satisfaction level, which was obviously lower than all the others listed above (p=0.000). Furthermore, the most serious levels of dissatisfaction appeared to be with the availability of car parking space (M=2.56, SD=1.142, p=0.000). A spatial-social comparison was further made to link the above social outcomes with the related planning inputs.

Table 7.1 Indicators for the layer Basic Needs

Sustainability Indicator	Data collection approach	data type
7.1 Satisfaction with educational facilities (SF_ED)	Questionnaire, sampling	Likert Scale
7.2 Satisfaction with healthy facilities (SF_HE)	Questionnaire, sampling	Likert Scale
7.3 Satisfaction with commercial facilities (SF_CM)	Questionnaire, sampling	Likert Scale
7.4 Satisfaction with social welfare facilities (SF_SW)	Questionnaire, sampling	Likert Scale
7.5 Satisfaction with cultural facilities (SF_CL)	Questionnaire, sampling	Likert Scale
7.6 Satisfaction with sports facilities (SF_SP)	Questionnaire, sampling	Likert Scale
7.7 Satisfaction with public space (SF_PU)	Questionnaire, sampling	Likert Scale
7.8 Satisfaction with inner surroundings (SF_IS)	Questionnaire, sampling	Likert Scale
7.9 Satisfaction with public transportation (SF_TR)	Questionnaire, sampling	Likert Scale
7.10 Satisfaction with parking spaces (SF_PK)	Questionnaire, sampling	Likert Scale

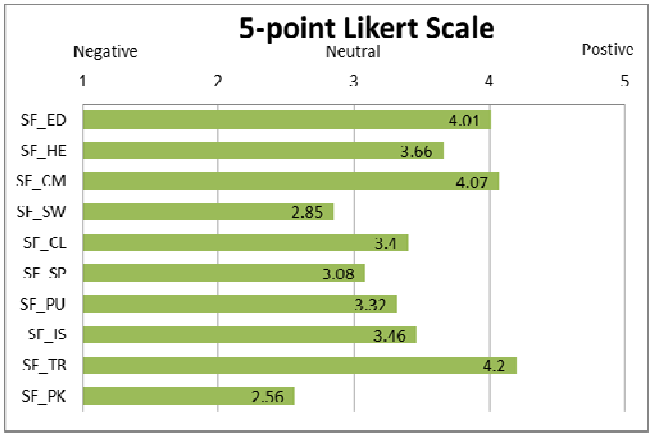

Figure 7.1 Basic needs appraisal results by 5-point Likert Scale

Table 7.2 shows the current planning regulations in which five types of facilities are basically required (Municipality, 2013): educational, health, commercial, cultural and sports facilities. Figures 7.2 and 7.3 presents the substantive spatial distributions of nearby amenities in the HD area. According to researcher's onsite observations and spatial measurements, many existed facilities have met the regulation requirements (Table 7.2). Interestingly, all of them have received a positive result in the above appraisal. The predominant emphasis with the planning of the type of educational facility is noticeable (UPDIS, 2005), not only because a large built-up area is required but also as an independent land provision[15],which are both compulsory in local planning practices. Hence, positive social satisfaction occurs when the related planning inputs on neighbourhood amenities are effective. Another important point is that residents can usualy access these facilties without entering gated neighbourhoods (Figures 7.4 and 7.5). This is because except schools and sports playgrounds, most of amenties are plannned as storefronts of neighbourhoods and it is thus convenient for neaby inbabitants to share and ustilise them within a walkable radius (Figures 7.6 and 7.7). This is often described as the implementation of mixed-use policy in Chinese neighbourhoods (Municipality, 2010, Ou et al., 2005). However, unlike other facilities, sports facilities are allowed to be embodied into neighbourhood sites in practice (Municipality, 2013). The control of available space for sports facilities could be considered in later neighbourhood design processes and embedded into enclosed neighbourhood development. However, its real social satisfaction among local inhabitants seems not to be as high as others in this assessment (Figure 7.1). A possible explanation is that the disappearance of open access is clear with the privatisation of developing facilities, which means a deprivation of the equal opportunity of sharing facilities. As a consequence, a potential social inequity may occur.

Table 7.2 Comparisons between planning requirement, implementation and social satisfaction

Type of facility	ED			HE	CM	CL	SP	SW*
	ED1 (MH)	ED2 (PR)	ED3 (KG)					
Minimum built up area (m^2)	14,850	6,500	6,400	400	500	300	-----	300
Minimum plot area (m^2)	25,200	8,700	7,200	-----	-----	-----	3,000	-----
Implementation in full	Y	Y	Y	Y	Y	Y	Y	N
Satisfactory level (Likert Scale)		4.01		3.66	4.07	3.40	3.08	2.85

Note: all indices comply with 20,000 capita. ED1(MH) here refers to middle schools and high schools; ED2(PR) means primary schools; ED3(KG) refers to kindergartens. Others: HE-healthy facilities; CM-commercial facilities; CL-cultural facilities; SP- sports facilities; SW-social welfare facilities The requirement on social welfare facility is indicated 'only a reference for mature urban areas, but not compulsory'(Shenzhen, 2013).

[15] Kindergarten is exempted from the independence requirement, (Shenzhen Urban Planning Standards and Guidelines, Municipality, 2013).

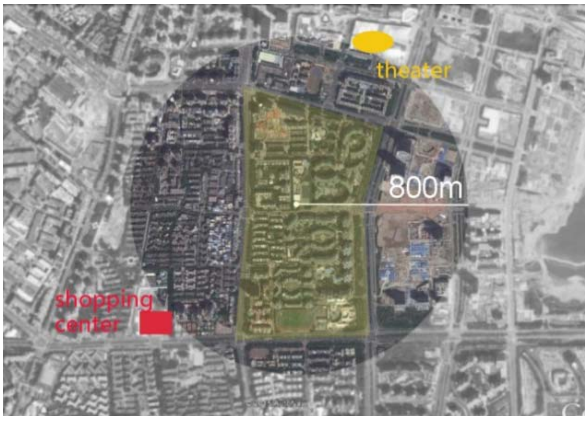

Figure 7.2 The radius of nearby neighbourhood amenities in the case study area

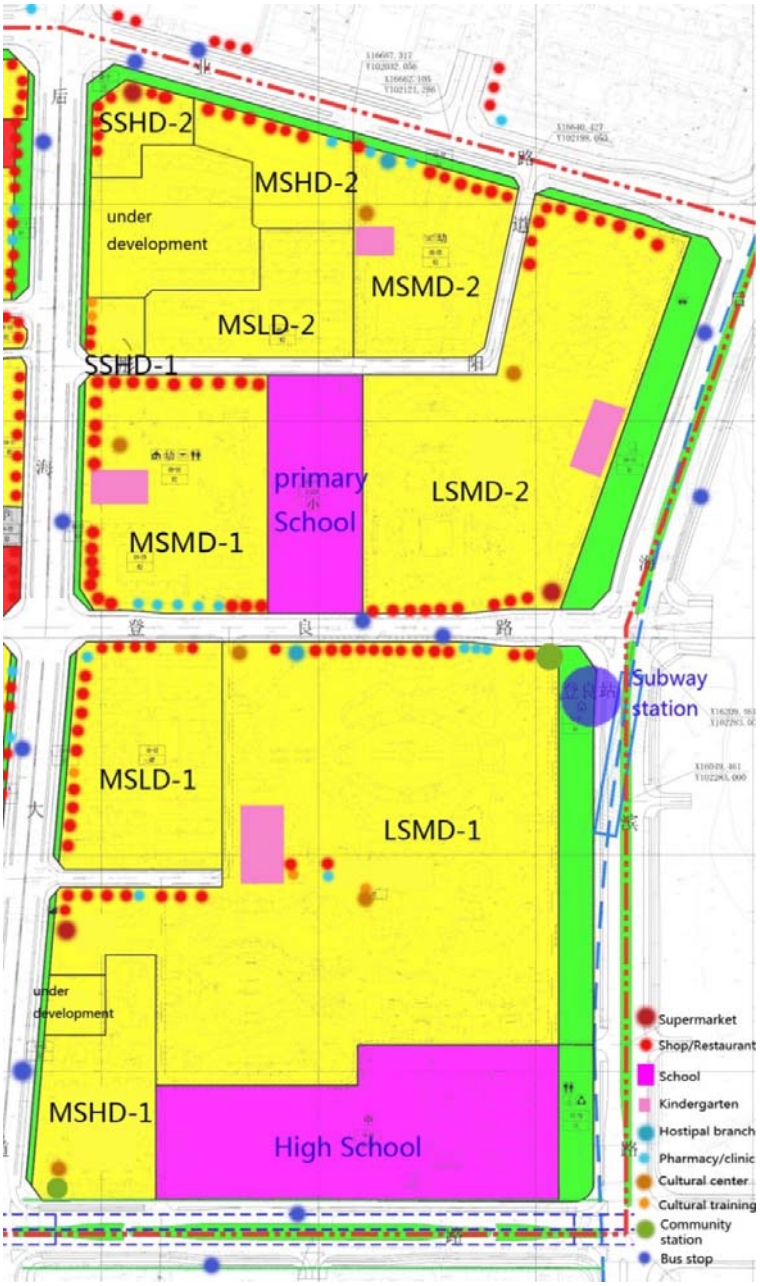

Figure 7.3 The spatial distributions of neighbourhood amenities in the entire HD area

Figure 7.4 A primary school in HD with an independent site

Figure 7.5 A neighbourhood kindergarten with a standalone entrance for the public

Figure 7.6 The ground floor commercial spaces with accesses to streets

Figure 7.7 A neighbourhood cultural centre (left) and its nearby hospital service branch (right)

(All the photos in this Chapter were taken by the author)

However, a lack of social welfare (SW) facilities in the HD area was evidently found. This type of facility, which is newly added into the inclusions of public facilities in Shenzhen (Municipality, 2013), provides social assistance to vulnerable social groups, such as elder, disabled and homeless people. Recently, nursing homes and special hospices have been particularly developed at the city and district levels (Shenzhen, 2007). According to the cultural tradition (CGSS, 2013a), the family based caring system is still the major social stand of modern Chinese society (Mu, 2000). This study also found that the dissatisfaction with SW facilities seems to be less pronounced by participants who live in large families (r=.137, p=.040, Table 7.3). As the elderly population continuously grows (Shenzhen, 2007), caring for aged people has been recently encouraged through neighbourhood–level social welfare practices (Wang, 2013, Xi et al., 2013), which is a supplementary solution for the elderly who are unable to be cared for by their families. The spatial counterpart is to deliver special nursing rooms, day care centres and activity centres with the development of neighbourhoods. These proposals, however, are suggestive but non-compulsory in the current planning process (Municipality, 2013). The general negative level of dissatisfaction in this assessment also affirms this point. At the moment, the function of social welfare is still mostly combined with the types of healthy/cultural facilities and neighbourhood service

centres in practice (UPDIS, 2007).

Interestingly, the two transport-related indicators represent diverse results. The public transportation satisfaction receives the highest score among the ten indicators of 'Basic Needs' meanwhile the lowest satisfaction occurs with parking space. Most large Chinese cities are now similarly perplexed by heavy traffic conjunctions due to the continual increase of the vehicle ownership (Liu and Guan, 2005). Under the great pressure of the overwhelming populations, public transportation has become a special planning concern in many Chinese cities (Pucher et al., 2007, Li et al., 2015) with a considerable enhancement being recently given to the further development of the public transport system (Wen and Zhao, 2014). The general positive outcome of the satisfaction with public transport (SF_TR) indicates that the local public transport network is already accessible in this area. Benefits to neighbourhoods are mostly through the services of a prime subway station that is connected to the subway network and ten bus stops that are linked with citywide mass bus routes. By contrast, not enough attention has been paid to the shortage of parking space, which has become a big headache (Zhang et al., 2009). It is also believed to be related to an issue of the public-private boundary in the planning system at the moment. Interviewee D1 indicates that particular solutions have not been provided enough by planners so far; now an insufficient number of parking spaces is prominent within the entire city but particularly in residential areas.

> 'I have suggested that the local authority could redevelop the greening area along the main road. Although it is feasible, there is no response for this 'cross-department proposal'. It is also because problems at the bottom neighbourhood scale would often be described as 'not a public issue' or 'out of the governmental responsibilities' (D1, 2011).

Additionally, the correlation analysis suggested a generally weak association between the demographic feature and the social satisfaction with neighbourhood amenities and facilities. As can be seen from Table 7.3, many demographic factors are not or only weakly associated with social satisfaction results. Thus, residents' basic needs satisfaction with their neighbourhood is not strongly affected by their social-demographic features.

Table 7.3 Spearman's correlation: socio-demographic features and basic needs satisfaction

	Spearman's	SP_ED	SP_HE	SP_CM	SP_SW	SP_CL	SP_SP	SP_PU	SP_IS	SP_TR	SP-PK
Age	Correlation Coefficient	-.008	.038	-.024	.007	.031	-.008	-.100	-.091	-.087	.126
	Sig.(2-tailed)	.907	.571	.719	.913	.642	.903	.133	.174	.193	.059
Household Member	Correlation Coefficient	-.071	.096	.030	.137*	.028	.046	.001	.040	.107	.154*
	Sig.(2-tailed)	.285	.148	.650	.040	.676	.491	.985	.548	.107	.021
Income	Correlation Coefficient	-.011	.092	.074	.081	.000	.083	.077	-.039	.069	-.085
	Sig.(2-tailed)	.875	.170	.270	.227	.999	.213	.248	.558	.299	.202
Length of Residence	Correlation Coefficient	.091	-.021	.007	-.102	.043	-.084	-.190**	-.185**	-.111	-.097
	Sig.(2-tailed)	.178	.759	.916	.130	.522	.215	.005	.006	.100	.153
Education Background	Correlation Coefficient	.008	-.001	.128	-.033	.016	-.077	.014	-.002	.144*	-.141*
	Sig.(2-tailed)	.907	.987	.056	.620	.807	.248	.834	.978	.031	.034

N=226, except N=220 for length of residence; **.Correlation is significant at the 0.01 level (2-tailed). *.Correlation is significant at the 0.05 level (2-tailed).

7.3 Variations in different patterns of neighbourhoods

The above result only presents a general character regarding the entire research area Houhai-Dengliang. However, as discussed in Chapter 6, varied neighbourhood forms present a split and unbalanced spatial feature. A question thus needs to be considered: is there any evident variation in the social satisfaction of basic needs based upon the variations of urban form? In this case study, the variation of basic needs satisfaction in different types of neighbourhoods was particularly analysed. The use of statistical analysis was also necessary as this could suggest whether a variance of the sample was significant enough to represent the entire population with certain confidence levels. The framework of analysis has also been discussed in Chapter 5. The results of 5-point Likert scale assessments were treated as interval scale data, for which the ANOVA test was a powerful statistical method to examine the variations between groups. Additionally, Levene's basic test for homogeneity of variances was further applied. This was because when the significance from this test was less than 0.05, then variances were great, and traditional parametric tests were not appropriate. Thus, the enhanced Welch F test was used instead of the normal ANOVA test in order to underpin the accuracy of analyses. The 'Tukey post hoc test' was additionally applied to compare the differences between each type of neighbourhood pattern. Similarly under the circumstance of violated data homogeneity, the enhanced Games-Howell analysis was applied instead of the Tukey post hoc test. The ANOVA result indicates the general variance of five neighbourhood forms is non-significant in the assessments of the social

satisfacion with educational, health, commcercial and cultural facilities (p>.05, Appendix Table 4.3), which, as discussed above, had all received a positive mean score. On the contrary, the entire group difference is significant at the confidential level 95% in the assessments of the social satisfaction with social welfare, sports facilities, public space, inner surroundings as well as satisfaction with public transport and parking space (p<.05, Appendix Table 4.3).

7.3.1 The Satisfactions with Educational Facilities (SF_EF), Health Facilities (SF_HF) Commercial facilities (SF_CF) and Cultural Facilities (SF_CL)

The satisfaction with educational, health, commercial and cultural facilities are similar amongst the five residential patterns (LSMD, MDHD, MSMD, MSLD and SSHD) without any significant difference (p>.05, Figures 7.8-7.11). It could mean that no underlying difference is found, or another possibility, that the difference is so small that they could not be detected using the methods employed. There is a theoretical possibility that a non-significant result may be from a Type II Error, commonly seen in social sciences as a challenge of measuring the complicated human behaviour (Knudson and Lindsey, 2014). This error may come from an insufficient sample size or a lack of sensitivity or accuracy in measurements. However, it could also be true that the unvaried result in each assessment presents a real similarity that existed among different neighbourhoods with having equal supports from these external amenities. It is thus necessary to connect the related planning input with the above revealed social outcome.

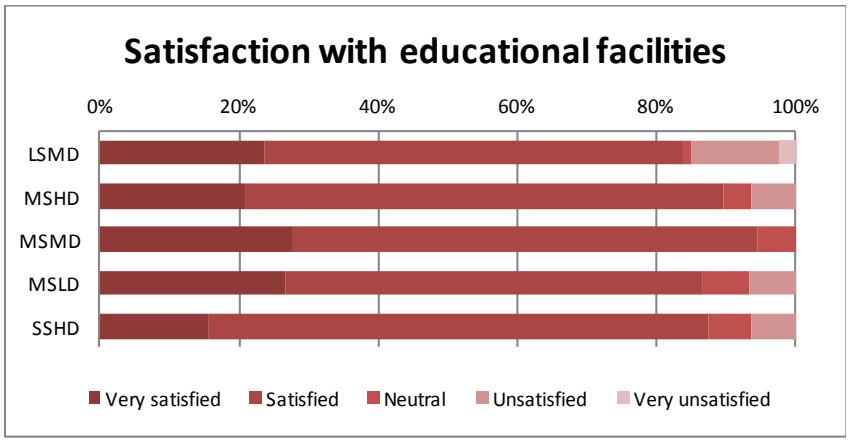

Figure 7.8 The satisfaction with educational facilities by the five forms

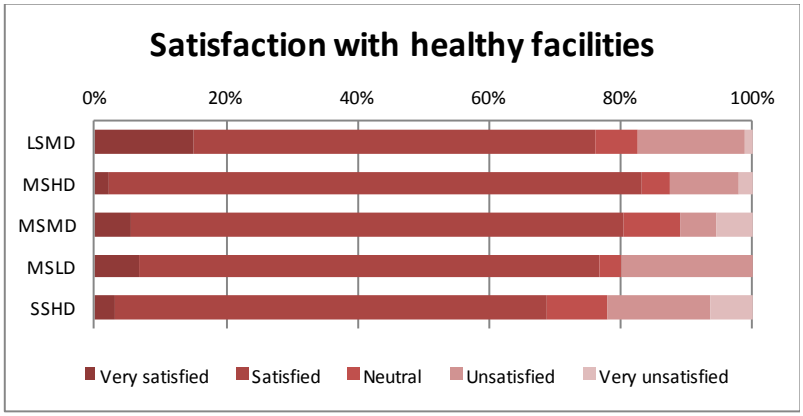

Figure 7.9 The satisfaction with healthy facilities by the five forms

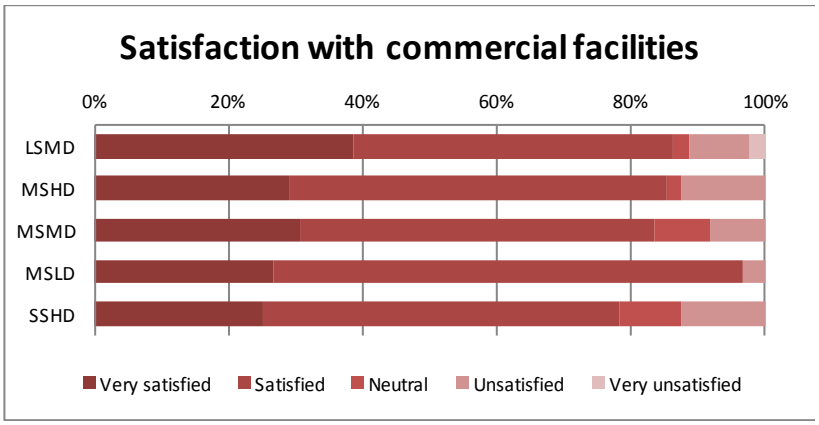

Figure 7.10 The satisfaction with commercial facilities by the five forms

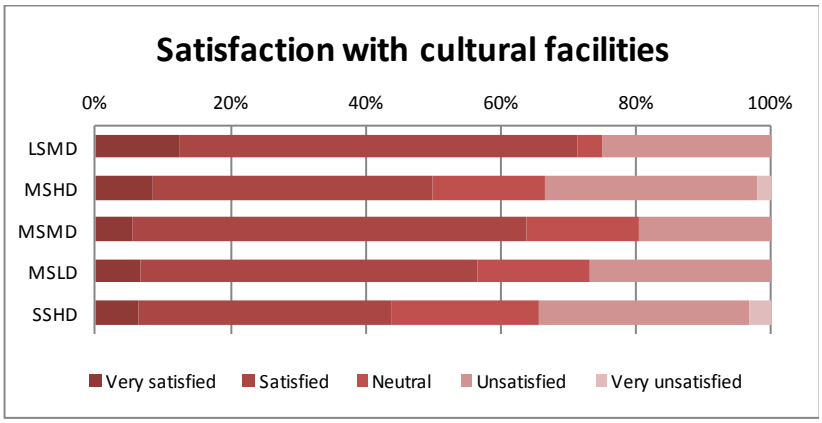

Figure 7.11 The satisfaction with cultural facilities by the five forms

The equity of sharing nearby public resources for the residents has been emphasised through the planning strategies and regulations (Shenzhen, 2007, Shenzhen, 2005). This is especially visible in educational facilities, which has been emphasised as an important aspect of urban planning (Li, 2008) in most Chinese cities for a long time often following Perry's 'neighbourhood unit' concept (Perry, 1929). Local education facilities are required to be integrally planned within each planning unit (Municipality, 2013), including high schools, elementary schools and kindergartens. A school is further required to be designated respectively on independent zoned land in Shenzhen's planning practices. A kindergarten in

this area is controlled to be with an open access to the nearby residents as well, although often it is not planned on an independent site. Under a higher level planning intervention and powerful regulation, the educational facilities are now equally shared by residents and thus the observed similar social satisfaction is a reasonable expectation and outcome. Likewise, the healthy service is equally shared within the entire HD area, such as hospital branches, pharmacy stores and clinics. So is the situation of cultural facilities, which includes plenty of neighbourhood cultural centres and skill traning agencies. Commercial space is encouraged to be mixed into neighbourhoods by the local planning system (Municipality, 2010). There are numerous small shops and markets using the frontage ground floor of a neighbourhood and occasionally even the first floor could be utilised for these purposes. Access to these helps to meet residents' daily shopping needs. In summary, a consistent outcome appears in educational, health, commercial and cultural facilities. The provision of these four types of facilities seems to be currently sufficient and there is no obvious spatial and social imbalance. Residents of the entire HD area have been endowed with equal opportunities in accessing and sharing these resources.

7.3.2 The Satisfactions with Social-Welfare Facilities (SF_SW), and Sports Facilities (SF_SP)

As discussed before, the current social welfare facilities were obviously insufficient. New strategies are definitely required regarding the increasing elderly population (Municipal Bureau of Statistics, 2011-2015) and the advocated 'social harmony' goal (Shenzhen, 2005). Nevertheless, attention still needs be paid to meet neighbourhood-level demands. There are still significant variations among different types of neighbourhoods in terms of the satisfaction with social welfare facilities ($F(4,221)=3.400$, $p=.010$) and sports facilities ($F(4,221)=5.616$, $p=.000$). In the SF_SW, only two groups receive a positive score, LSMD ($M=3.06$, $SD=1.071$) and MSMD ($M=3.08$, $SD=.967$). A striking observation is the high level of dissatisfaction in the group SSHD (59.38%, Figure 7.12), the mean score of which ($M=2.41$, $SD=.979$) is significantly lower than LSMD and MSMD ($p<.05$, Appendix Table 4.4). This outcome indicates the residents living in SSHD neighbourhoods are more likely to be dissatisfied with social-welfare facilities than residents in LSMD and MSMD neighbourhoods. Interviews and observations were further implemented to understand the social variation across space. Residents in SSHD neighbourhoods feel more depressed. An elder resident told the researcher that

> *'My wife and I together live with my son. He is busy working every day, so in the daytime it is only us staying in neighbourhoods. The common rooms in this*

neighbourhood are too limited and often overcrowded. There is less welfare supporting spaces and services for us inside the neighbourhoods. We usually go outside instead.'

However, LSMD residents seem to be more relieved and optimistic than others. Interviewee F1 told the researcher that,

'My son occasionally visits me from another city. I know there is a shortage of the nearby nursing home or special caring centre for aged people, but I am not disappointed as there is plenty support in my neighbourhood. The neighbour service centre provides some rooms for the elderly and they also take care and help us a lot. Furthermore, we elder people are often self-organised in public spaces together by some activities.'

Thus, community-level welfare nursing and services are valuable, despite many elderly residents living with their family members. Home nursing, legal aid, accompanied shopping and health services are often greatly welcomed by the more aged population (Figures 7.14, 7.15). To move forward, adding elderly care rooms and activity centres into neighbourhoods, which is off course beneficial, and integrating these with the development of other types of facilities would be a practical planning solution for the shortage of social welfare facilities. However, the improving space may vary in different neighbourhoods with spatial character, population size including demographic characteristics and servicing ability in practice. The evidence in this study indicates that high density and small scale neighbourhoods are both more constrained in the provision of social welfare spaces and services for its residents.

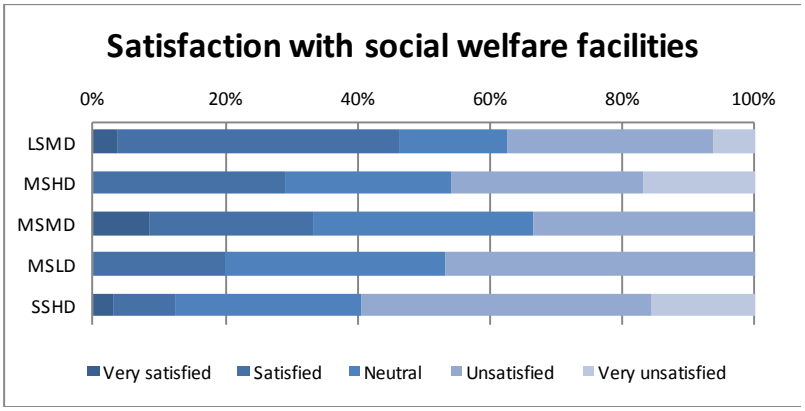

Figure 7.12 The satisfaction with social welfare facilities by the five forms

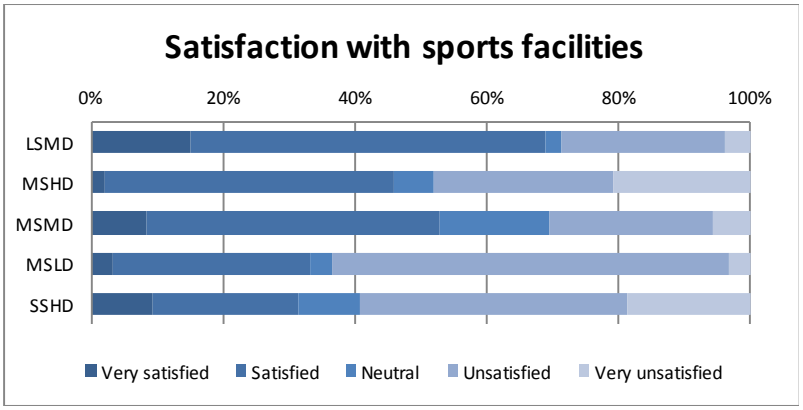

Figure 7.13 The satisfaction with sports facilities by the five forms

Figure 7.14 A neighbourhood corner for elder people

Figure 7.15 Social welfare is taken into account by a neighbourhood service centre

Another obvious spatial watershed exists in the satisfaction with sports facilities. The positive contentment ratio reaches 68.75% in the LSMD areas but only 45.83% in MSHD, 33.33% in MSLD and 31.25% in SSHD (Figure 7.13). Comparing the means of Likert scale data, the results of MSHD (M=2.79,SD=1.271), MSLD (M=2.70,SD=1.055) and SSHD (M=2.63,SD=1.289) are significantly lower ($p<0.05$, Appendix Table 4.4) than LSMD (M=3.51,SD=1.136). The two assessment findings coherently indicate that residents in SSHD neighbourhoods are less likely to feel satisfied with both social welfare and sports facilities than residents in LSMD neighbourhoods. Compared with the other type of facilities, the feature of sports facilities is indeed more unique, as it may further require for tangible outdoor playgrounds besides interior spaces (such as gyms, sports halls). During onsite observations, sports facilities were found to be better provided and utilised in large and medium neighbourhoods (Figure 7.16), which are obviously more capable of providing these utilities in practice, such as outdoor playgrounds and fitness equipments - they are usually integratedly designed with neighbourhood public spaces and landscapes. Numerous sports activities were also found inside these neighbourhoods. Conversely, sports facilities would be limited in small scale developments due to great spatial constraints (Figure 7.17).

Figure 7.16 Outdoor sports facilities in a medium scale neighbourhood

Figure 7.17 Sports facilities at a podium roof in a small scale neighbourhood

But why has this obvious spatial difference not received enough attention so far? Rather than looking at individual neighbourhood, the local planning regulation, the SUPG (Shenzhen, 2013) suggested a general baseline for sports facilities, at least 700 m^2 for 10,000 to 20,000 population. However, this is articulated as applying at a higher spatial scale equivalent to a large urban block. Lacking any clear statements for neighbourhood-level controls on sports facilities, there may not be any effective guarantee on the quality and quantity of sports facilities in neighbourhood developments. The gated and privatised neighbourhood development thus seems to have a inherent defect. The insufficient provision of sports facilities appears to be more serious in those small-scale based neighbourhoods characterised by spatial fragmentation. This means sports facilities, which may have traditionally been offered abundantly in large neighbourhoods, can no longer be shared and utilised by residents in other local neighbourhoods due to the gated patterns of development and private management excluding some residents from such facilities. Spread out in different neighbourhoods without a standalone plot that could be directly opened to the public, now sports facilities have become more privatised in reality, only benefits for certain residents. But because the minimum quantitative requirement seems to have been achieved by an upper-level review (urban block), planners could be assertive to claim sports facilities have been well planned and implemented (Ye et al., 2012). Nevertheless, the real situations of sports facilities seem to vary greatly inside different gated neighbourhoods. Thus, a spatial imbalance among different neighbourhoods could trigger a further social inequity in terms of the basic needs satisfaction.

7.3.3 The Satisfactions with Public Space (SF_PU) and Inner Surroundings (SF_IS)

The other two indicators, satisfactions with public space (SF_PU) and inner surroundings (SF_IS) have revealed similar outcomes. They both describe the internal liveability of neighbourhoods, but the former emphasises on the quality of specific common communicative places (Figure 7.18) meanwhile the latter cares more about the quality of outdoor open spaces, especially the green areas and pedestrian spaces (Figure 7.19). For the assessment of SF_PU, two negative results appear in the groups MSLD (M=2.27, SD=.980) and SSHD (M=2.25, SD=1.270) meanwhile the other three neighbourhood groups report high degrees of satisfaction. In the assessment of SF_IS, the only two negative results are also from the same groups, MSLD (M=2.73, SD=1.143) and SSHD (M=2.72, SD=1.276). Interestingly, extreme and significant differences are found in both the assessments of public space (Welch's F(4,84.595)=33.304, p=.000) and inner surroundings (Welch's F(4, 85.772)=16.667, p=.000). For SF_PU, the satisfaction rates (see Figure 7.20) in the groups of MSLD (20%) and SSHD (25%) are both significantly lower (p<.05, Appendix Table 4.5) than the groups of LSMD (92.5%), MSMD (75%) and MSHD (58.33%). Furthermore, the satisfaction level of MSHD was also found to be substantially lower than LSMD and MSMD (p<.05). For SF_IS, the results appear similar (Figure 7.21). The LSMD (90.00%) and MSMD (60.42%) form of development report significantly higher satisfaction rates (p<.05, Appendix Table 4.5) than the other three groups MSHD (60.42%), MSLD (36.67%) and SSHD (37.50%). In summary, there is a great likelihood that residents in LSMD and MSMD neighbourhoods are happier with neighbourhood public space and inner surroundings compared with the residents of MSHD,MSLD and SSHD neighbourhoods.

Figure 7.18 An attractive neighbourhood public space that links people

Figure 7.19 Neighbourhood inner surrounds includes inner roads, pedestrian trails and greenings

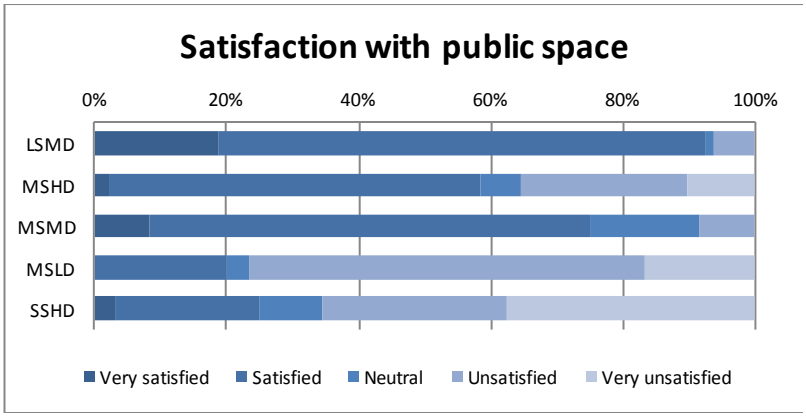

Figure 7.20 The satisfaction with neighbourhood public space by the five forms

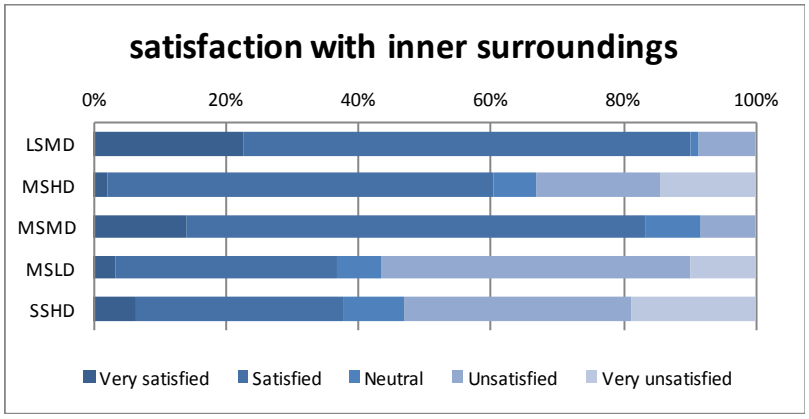

Figure 7.21 The satisfaction with neighbourhood inner surroundings by the five forms

The role of public space is proved to be crucial to the basic needs satisfaction in this case study. In theory, public space plays a key role in neighbourhood liveability (Lee, 2011, De Visscher et al., 2011, Stauskis and Eckardt, 2011). According to the correlational analysis result (Table 7.4), the satisfaction with public space is significantly related to the other four indicators: the satisfation with health facilities (r=.652, p=.041), social welfare facilities (r=.832, p=.0003), sports facilities (r=.721, p=.019) and inner surroundings (r=.920, p=.0000). Bunnell (2008, p.10) emphasised that 'creating and maintaining successful public spaces that reinforce an authentic sense of place is a critical part of the challenge that planners face in making great communities'. The long-term impact is also found in that they 'served to create an illusion of collaboration and inclusive public space which was starkly revealed to be primarily focused on improving city's wider image' (Inroy, 2000, p.23). From the researcher's on-site observation, there is still a great diversity of public space in different neighbourhood patterns. In LSMD and MSMD neighbourhoods, energetic social lives may have been promoted by the vital public space (Figure 7.22). In contract, a lack of high-quality public space is also common in SSHD and MSLD neighbourhoods. According to this outcome, public space in neighbourhood development should be highlighted and better treated in planning practice. Nevertheless, the current planning regulation does not provide

specific guidelines on it. The proportion and quality of public space could be developed as core planning controlling indices, and their attibutes could be further clarified on the actual notice of planning pemission (CPDP in Shenzhen). And a remediation could be accordingly required in high-density small-site development where inner public space may be limited. The design of public space in neighbourhood proposals could be more critically reviewed and judged to ensure its full implementation during neighbourhood development.

Figure 7.22 The spatial distributions of the key sports facilities and public spaces in HD neighbourhoods

(Drawn by the author)

Table 7.4 The correlation between the satisfaction with public space and other indicators

SF_PU	SF_HE	SF_SW	SF_SP	SF_IS
Pearson Correlation	.652*	.832**	.721*	.920**
Sig. (2-tailed)	0.041	0.003	0.019	0.000

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).

7.3.4 The Satisfactions with Public Transportation (SF_TR) and Parking Spaces (SF_PK)

Access to public transport is often used as an indicator of social sustainability (Dempsey et

al., 2011, Vallance et al., 2011, Holden, 2012a). The lack of services or distance to transport nodes, inconvenient bus routes or connections are commonly obstacles for neighbourhoods (Vine et al., 2012). In the assessment of public transportation, four groups LSMD, MSMD, MSLD and SSHD all receive a generally 'satisfied' result (M>4.0, Figure 7.23). An observed general variance among these groups (F(4,221)=5.628, p=.000) is mostly due to MSHD's relatively low score (M=3.81,SD=.915). However, MSHD's lower score is only significant when comparing with LSMD and MSMD (p<.05, Appendix Table 4.4). As distance is a factor that may reduce satisfaction with accessibility to public transport (Susilo et al., 2012), a decreased contentment with public transportation may occur in a neighbourhood that is at a further distance from the local metro station. During the survey, some residents of MSHD-1 complained that accessibility to the subway was relatively inconvenient, as the neighbourhood was the furthest away from the HD subway station (see Figure 6.11 in Chapter 6), which was coincidently closed to the LSMD and MSMD neighbourhoods. Based on this evidence, the researcher treats the above-displayed variance as a result of an outlier. For neighbourhood level development, the limited radius of metro stations is what the transportation system often have to face in reality (Xiang, 2013). A strengthened and continuous construction of public transportation systems should be essential to decrease uncovered urban areas and avoid spatial inequity (which has already been undertaken at the present). However, in general, no significant variation is found except the fluctuation in a single case (MSLD-1), which suggests a generally harmonious development of public transportation in the HD area.

A more significant difference appears in the satisfaction with the availability of local parking spaces (Figure 7.24). As has been discussed previously in section 7.1, this has become a headache for the city. The dissatisfaction rate, which is 41.67% in MSHD, reaches 52.78% in MSMD and 58.75% in LSMD, and as high as 73.33% in MSLD and 75% in SSHD. A significant group difference (Welch's F(4, 93.457)=6.621, p=.000) is found in the enhanced ANOVA test; In enhanced Post hoc tests, the score of most dissatisfied neighbourhood SSHD (M=1.88, SD=1.008) is significantly lower than the other three groups MSHD, LSMD and MSMD (p<.05, Appendix Table 4.5). The score of MSLD (M=2.20, SD=.847) is also considerably lower than the group MSHD (M=2.98, SD=1.158, p<.05). However, it can be seen that the mean scores of the five groups are all negative. A commonly experienced view relating to the insufficiency of parking spaces in neighbourhoods is thus evident. It is further found that the spatial input in the parking spaces is linked with the above social satisfaction. The

parking ratio provided in MSHD reached 0.62 (parking space per household), but only 0.32 in MSLD and 0.45 in SSHD. A strong spatial-social interaction is found in the correlation analysis (r=900, p=.037). The results generally indicate the low parking space ratio used in planning would be a key reason for the great insufficient parking spaces avaiable in SSHD and MSLD. The inadequacy of relevant planning regulations is thus evident, especially for the control of small scale developments. However, due to the real constrait, lacking avaiable outdoor spaces is often appreant in small scale developments. Thus, solutions to the shortage of parking spaces may need to be considerd externally, which may require higher-level planning intervetions.

The above results indicate the tension between the development of public transportation and provision of private parking space. It is also a further demonstration of the sustainability debate discussed at the beginning of this thesis. More balanced considerations between different dimensions are required. The low social satisfaction with car parking space suggests some difficulties exist in the current transport planning at the neighbourhood level. However, it is also related to the entire urban transportation system. The bottom-level social indication does not necessary mean that urban policies should completely divert to fulfil this social need. A gap between the shortage of urban space and the increase in car ownership is a tangible issue for most Chinese cities at present. Undoubtedly, public transportation should still be considered as the major means of developing local transport systems, which has been widely agreed as a core strategy that contributes to sustainable urbanism (Newman, 2010, Vance and Hedel, 2007). It also indicates that achieving a balanced sustainable development is still a big challenge for urban planners. High-level, comprehensive decision-making is a complex process that needs to overcome the contradiction between subjective reflections and objective conditions, and the argument across departments and even generations.

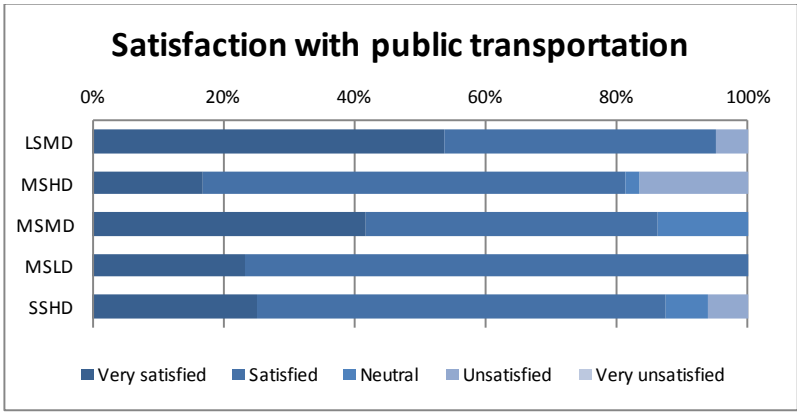

Figure 7.23 The satisfaction with public transportation by the five forms

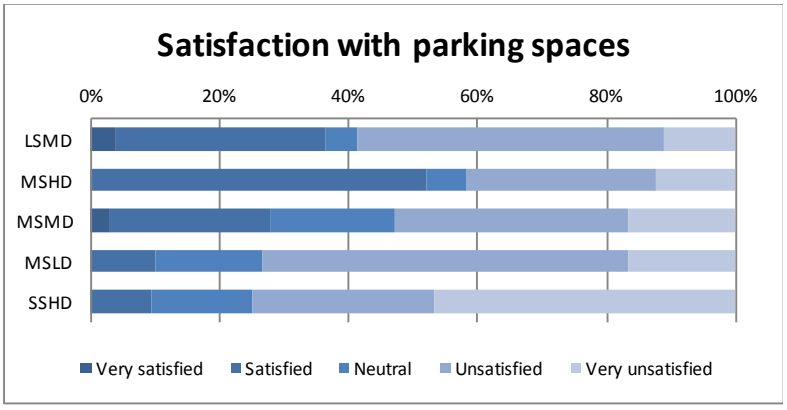

Figure 7.24 The satisfaction with parking spaces (SP_PK) by the five forms

7.3.5 The overall appraisal results and social sustainability indices

The basic needs appraisal results have been synthesised (see Table 7.5). An overall judgement is based on the entire ten indicators. It avoids the potential inaccuracy from using of single indicators, which might be a distortion due to unexpected experimental errors. The method of Z-score was applied calculating the overall scores of each indicator. It is expected that the range of indicators is usually narrowed between -2 and 2 (Castree et al., 2013). It is apparent that the LSMD and MSMD groups achieve the overall positive results meanwhile the SSHD, MSLD and MSHD are all negative, which are recognised as less sustainable forms regarding the basic needs satisfaction. From a visualisation of the final results, the relative advantages and disadvantages of each type of neighbourhood are shown in Figure 7.25 using a radar chart. This includes all the indicators used in this basic needs appraisal. According to each detailed assessment, two groups, LSMD (M=0.755, Z-score) and MSMD (M=0.692, Z-score) receive a generally positive outcome. Based on this strong evidence, the LSMD and MSMD are identified as the 'recommend form'. The overall results of MSHD (M=-0.231, Z-score) and MSLD (M=-0.157, Z-score) are both discovered to be negative, which means that the basic needs satisfaction in these neighbourhoods would

be below the neutral level. The SSHD is especially problematic not only because of its lowest final score (M=-1.059, Z-score) but also because of the negative scores that were repeated. Comparing with other four patterns, the SSHD pattern appears to have great deficiencies in satisfying the basic needs its inhabitants.

Table 7.5 Social sustainability index I: Z-score results for the layer of 'Basic Needs'

Form	SP_ED	SP_HE	SP_CM	SP_SW	SP_CL	SP_SP	SP_PU	SP_IS	SP_TR	SP-PK	Overall
LSMD	-1.16465	0.76337	0.46524	0.95549	1.14338	1.38957	1.15535	1.16813	1.1507	0.5207	**0.755**
MSHD	0	0.59373	-0.37219	-0.42466	-1.13445	-0.48401	0.06768	-0.24827	-1.4759	1.16582	**-0.231**
MSMD	1.4974	0.42409	0	1.02627	0.74141	0.713	0.79279	0.92941	0.48363	0.31334	**0.692**
MSLD	0.24957	-0.08482	1.30268	-0.21233	0.16079	-0.7182	-0.99583	-0.91668	0.27517	-0.6313	**-0.157**
SSHD	-0.58232	-1.69638	-1.39573	-1.34476	-0.91113	-0.90036	-1.02	-0.93259	-0.4336	-1.36858	**-1.059**

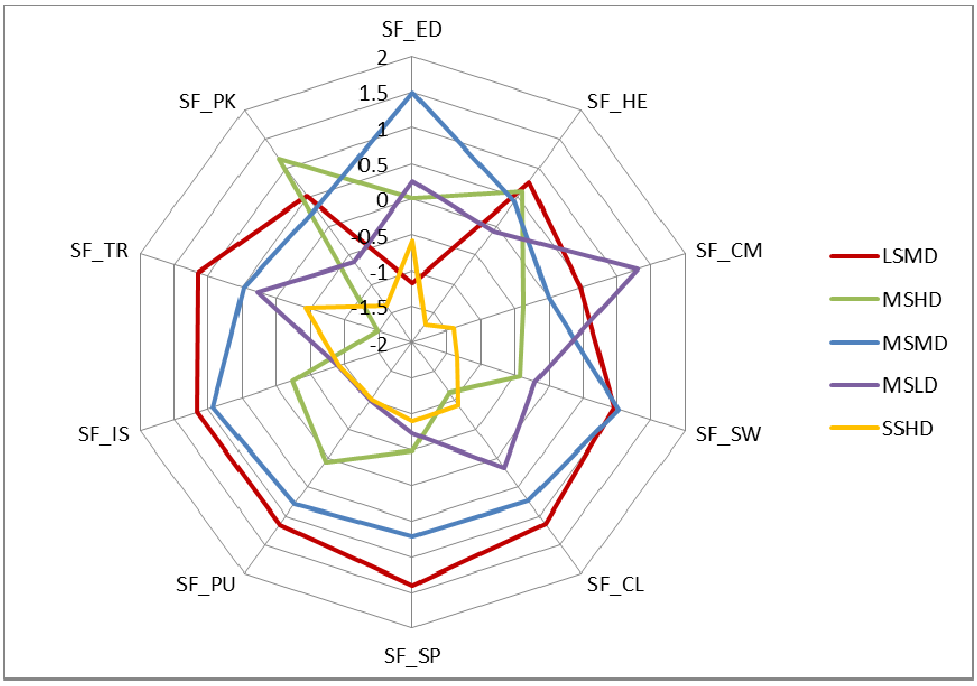

Figure 7.25 Sustainability Index: Basic Needs of Five Patterns of Neighbourhoods

7.4 Reflections on the current planning system

7.4.1 Understanding the impacts of urban form variables

The associations between urban form variables and social sustainability outcomes are further explored. The correlation test result (Table 7.9) indicates that urban form variables are not associated with satisfactions with many types of public facilities, such as educational, health, commercial, and cultural facilities ($p>0.05$). This is consistent with the former evidence that the variations of their related indicators SF_EF, SF_HF, SF_CM, SF_CL in different patterns of neighbourhoods are all weak. However, the variable of site scale is

found to be positively correlated with the satisfaction with sports facilities, public space and public transport, SF_SP (r=0.692, p=0.027), SF_PU (r=0.672, p=0.033), and SF_TR (r=0.637, p=0.047). These associations may further indicate that certain elements of the basic needs satisfaction could be improved through planning interventions by enlarging neighbourhood site in practice instead of the current tightening trend. For example, according to the on-site observation in the case study, sports facilities are assembled within two LSMD neighbourhoods in which vibrant playgrounds, equipment and utilities are provided (Figure 7.22).

Table 7.6 Person's correlations: urban form variables and basic needs indicators

Urban Form variables	**7.1.1 SF_ED**	**7.1.2 SF_HE**	**7.1.3 SF_CM**	**7.1.4 SF_SW**	**7.1.5 SF_CL**	**7.1.6 SF_SP**	**7.1.7 SF_PU**	**7.1.8 SF_IS**	**7.1.9 SF_TR**	**7.1.10 SF_PK**
Site scale	-0.196	0.388	0.172	0.625	0.384	**.692***	**.672***	0.576	**.637***	0.296
Sig. (2-tailed)	0.588	0.268	0.634	0.054	0.274	0.027	0.033	0.081	0.047	0.406
FAR	-0.204	-0.444	-0.59	**-.771****	-0.368	-0.461	-0.429	-0.421	-0.417	-0.307
Sig. (2-tailed)	0.572	0.199	0.072	0.009	0.295	0.18	0.216	0.226	0.23	0.388
BCR	-0.121	-0.589	-0.477	**-.695***	-0.529	**-.665***	-0.613	-0.421	-0.33	-0.619
Sig. (2-tailed)	0.738	0.073	0.164	0.026	0.116	0.036	0.059	0.225	0.352	0.056
D_P	-0.139	-0.616	-0.539	**-0.749***	-0.384	-0.446	-0.552	-0.493	-0.26	-0.557
Sig. (2-tailed)	0.701	0.058	0.108	0.013	0.273	0.197	0.098	0.147	0.469	0.094

N=10 * Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).

In contrast, density (FAR) is detected to be mostly negative in this assessment, in which a considerable negative association with social welfare facilities (r=-0.771, p=0.009) is revealed. Since the FAR has been previously indicated to be strongly associated with population density, overcrowding could also be reasonably linked with the weak satisfaction in terms of social welfare facilities (r=-0.749, p=0.013). Additionally, the building coverage ratio is also negatively associated with the satisfactions with social welfare facilities (r=-0.695, p=.026) and sports facilities (r=-0.665, p=.036). Undoubtedly, social dissatisfaction is indicated to be extremely sensitive to an overcrowded population, which is associated with FAR; the consequence of shortages of available outdoor space is also influenced by BCR. As the SSHD cases would have these negative influences from FAR and BCR synchronously, the level of social welfare satisfaction would, therefore, be significantly affected as a result. This explains why the SSHD received the lowest score in this assessment. The evidence from social welfare facilities further indicates that the high-density development would have real spatial limitation in provision and social difficulty in sharing and utilisation.

This assessment identifies the nexus between the neighbourhood social sustainability and the urban form in the layer of basic needs. The roles played by different urban form variables are discovered to be significant in shaping basic needs satisfaction. Firstly, neighbourhood scale has a strong continuous positive effect. A large neighbourhood development can more efficiently support the basic needs of residents than a small one. A prioritised policy in the land use planning should, therefore, be proposed guiding the detailed urban form regulation and neighbourhood design at the very beginning regarding this impact. Furthermore, the effect of variable FAR is revealed to be constantly negative (see Table 7.6) and that increasing density in the practice may not be able to enhance social sustainability. Advocates of the high-density mode in the literature (Gordon and Vipond, 2005, He, 2005, Larice, 2005) are thus questioned and challenged by this investigation.

7.4.2 Conflicts and imbalances in local planning implementation

The first issue is the scale that the planning system currently focuses on and the depth that the planning practices proceed into. What the entire HD area currently presents, according to the previous discussion, is an advanced basic needs satisfaction that receives eight generally positive results out of ten among the entire 226 participants. Moreover, there is less variation using the current planning's scale of the urban block, by which the HD area could be further divided into two blocks (see Chapter 6, Figure 6.10). The independent T test suggests that nine indicators out of ten are non-significant ($p>.05$, Appendix Table 4.6); the only one significant difference lies in the varied public space ($T(190.276)=2.261$, $p=.025$). Nevertheless, a substantial variance appears when the research focus goes down to the neighbourhoods comparing the five patterns of them (Figure 7.25). According to the previous discussions, six indicators offer vastly different outcomes, which visibly represents the social inequity at the bottom neighbourhood scale. Whilst a general satisfaction with basic needs and a balance of spatial resources at the urban block level is evident, social sustainability has not been considered yet at the neighbourhood level, which is particularly evident from the above observed variations in different neighbourhood forms.

A bottom-up approach to achieve social sustainability has been widely suggested to be essential, both in practice and by the academy (Berkeley, 2012, Smith, 2014, Rudlin and Falk, 2009). This is a new challenge for the Chinese planning's top-down traditional appoarch (Bruton et al., 2005, Ng and Tang, 2004). The tasks of pursuing social sustainability in upper-level policies may have been proposed in Shenzhen, as discussed in Chapter 6, but

here what the study finds is the lacks of clarity and implementation mechanism of the social sustainability at the bottom, neighbourhood level. The results indicate that social satisfaction can be influenced by spatial variations and thus there is a nexus between social sustainability and urban form. Although the current system has attempted to provide sufficient amounts of amenities and a balanced planning of resources at the urban district and urban block levels, there is a clear planning gap at the neighbourhood level. The social variability of basic needs satisfaction among residents is evidently linked with the fragmented and intensified urban form at the scale of neighbourhoods. To move forward, these imbalanced provisions of facilities that influence neighbourhood social sustainability need to be reconfigured. A control on urban form variables is also crucial for future new development at the very beginning. However, it is difficult to change those for many existing neighbourhoods, including the HD area in this case study. The counterpart plans for improving social inequity would be different; a more collaborative approach to better integrate and share urban resources will be indispensable. Intervention could both consider the spatial resource integration and social capital involvement to target the evidenced inadequacy of sports facilities, public spaces, and car parking spaces and especially for the neighbourhoods in great inadequacies. However, a reintegrating of urban space and a reuniting of neighbourhood facilities may not easily comply with the current top-down planning system that is already operating at a higher level above local neighbourhoods.

The public-private boundary is another challenge for the planning system, as the examination of neighbourhood amenities in this case study clearly finds two vastly different situations. In general, the assessments of educational, commercial, health, cultural facilities and public transportation have all received equal levels of satisfaction among different neighbourhoods. However, the other five assessments remain greatly varied. These include neighbourhood public spaces, inner surroundings, parking spaces as well as social welfare and sports facilities, which are largely provided by the private sector at present. This distinction seems to be from a dichotomy of the levels of provision between the public and private sector. Clearly the educational, health, commercial, cultural facilties and public transport accessiility all have public attributes, which are all focused by the spatial regulations with years of continuous planning input in Shenzhen (UPDIS, 2005, Municipality, 2010). In contrast, neighbourhood public space, inner surroundings, parking spaces as well as social welfare and sports facilities are now inclined to be more private and that are separately and internally generated by individual developers. There is a traditional emphasis

on the configuration of public facilities in Shenzhen's statutory plan system and its effective implementation has also been observed in this chapter. These are beneficial to residents of different neighbourhoods so their basic needs can be satisfied through an equally sharing of amenities and resources. In contrast, there are significant variances in spaces and facilities provided by the private sector, suggesting a pronounced spatial imbalance between neighbourhoods. Under the gated neighbourhood forms, internal liveability seems to have been neglected by the planning system and particularly the residents in SSHD neighbourhood would be in a shortage of receiving services from many necessary internal amenities. Certain facilities that were supposed to be pubic have become private inner products of gated neighbourhoods. And the current lack of a public-private partnership may be a problem for neighbourhood development. The builder may have been required to provide physical accessible space as well as the housing itself, which should normally include sufficient parking spaces, daily fitness facilities as well as greening and landscaping (Ministry of Construction, 2011). Despite their energetic contributions to decent neighbourhood atmosphere (Yang and Zhang, 2014), many of these, however, may have not been fully implemented in neighbourhood development because many factors are flexible and negotiable between the Bureau and developer when planning is operationalised at the neighbourhood level. These inner spaces are out of the scope of the planning regulation, which swings between the public and the private sphere as a 'grey zone'.

External liveability and internal liveability both offer various benefits to residents. According to the way the current planning system operates, neighbourhood external liveability is mostly influenced by nearby amenities that provide fundamental daily services. District plans and regulatory plans have made a specific focus on these and established rigorous control. In practice, certain external resources have been effectively integrated traversing different neighbourhoods, such as educational and commercial facilities, during which a spatially open attribute is crucial. By contrast, in the enclosed environment, sports facilities, inner public spaces and parking spaces are inclined to be private and current are not effectively controlled by the current regulations. However for Shenzhen's urban neighbourhoods, it is more necessary to enhance internal liveability thus to promote neighbourhood development on the basis of 'particular inherent physical qualities in the environment' (Vine, 2012, p.160). Internal liveability's great benefits to neighbourhood sustainability is significant. For instance, it provides space for residents to relax and recreate, enhance social activities and shape social cohesion (Yang, 2004, Gao, 2002, Leby and

Hashim, 2010). The spatial segmentation therefore may cause serious social dissatisfaction and social unfairness. Evidence suggests this is more authentic and tangible in the type of SSHD neighbourhood in which resident's basic needs satisfaction appears to be extremely low. A special concern for the inner space of neighbourhoods is necessary in planning approaches, and efforts of promoting greater sustainable will in turn ensure greater spatial and social justice.

7.5 Conclusion

A systematic social sustainability appraisal for the layer of neighbourhood basic needs has been implemented in the case study. This chapter analysed the results and identified their relationships with the current urban form. A general positive social outcome has been achieved at a large scale. However, a significant variation of basic needs satisfaction was also found in different patterns of neighbourhoods, in which the mode of the small-scale high-density neighbourhood is evaluated as a non-sustainable pattern. There is a simultaneous social injustice with the spatial inequality through the investigation of the current planning input and its links with social outcome. The current planning mechanism, which may have achieved a fair justice at an upper level, usually within its idealised planning units, however, may eventually deviate when transferred and interpreted down at the lowest level, namely neighbourhoods. A watershed appeared from the basic needs satisfactions also draws a clear public-private boundary in the local planning practice, which is associated with the gated form of new urban neighbourhoods. The current planning and governance systems, which traditionally focus on the publically provided urban resources and local accessible community services, have paid little attention to the 'more privatised' inner space of neighbourhoods. Without clear guidance and control, the fragmented private development would not necessarily guarantee the internal liveability of neighbourhoods and a potential social inequity would occur as a consequence. These gaps will be sequentially examined in Chapter 8 and 9 from the other two perspectives of social sustainability, which are 'social networks' and 'community development'.

8. SOCIAL SUSTAINABILITY APPRAISAL: THE LAYER OF 'SOCIAL NETWORK'

This chapter discusses the appraisal of the second layer 'social networks' and constitutes two themes: social cohesion and social interaction. Each theme is assessed by a series of indicators that were established in Chapter 4 and measured using a combination of questionnaire survey and direct observation. Comparisons are made between different neighbourhood patterns in respect to the variances of the levels of social network development. Potential associations between the outcome and urban form variables as well as demographic factors are further discussed. The chapter ends with a discussion of possible interventions for promoting social network development.

8.1 Introduction to data, measurements and variables

As stated in Chapter 4, ten indicators were introduced to measure the development of social networks under the established research framework (Table 8.1). Firstly, five indicators were developed to examine social cohesion: the sense of belonging, perception of neighbourhood character, neighbours' mutual recognition, perception of neighbours' helpfulness and social group memberships. The data from these indicators was collected entirely from the social sustainability appraisal questionnaire (Appendix 1). Secondly, for the theme of neighbourhood social interaction, five indicators were produced using multiple data collection approaches, in which both subjective and objective assessments, as suggested by various studies, were felt to be necessary (McCormack et al., 2004, Clark et al., 1990, von Wirth et al., 2015). To understand the individual willingness to participate in neighbourhood-based activities, the assessment was undertaken via a questionnaire which explored the length of daily time spent on activities inside and outside neighbourhoods. From a different perspective, direct on-site observation was used to evaluate three indicators: the observed frequency of interaction (OFI), spatial intensity of interaction (SII) and strength of social interaction (SSI). As introduced in Chapters 4 and 5, these three different indicators were all based on a series of detailed observations of the number and type of activities that occurred inside neighbourhoods. The OFI was a representation of the probability of the occurrence of outdoor activities among neighbourhood populations. Within a limited neighbourhood boundary, the second indicator, SII, demonstrated the intensity of human activities in terms of space. Lastly, the social strength identified people's

willingness to engage in neighbourhood interaction by analysing the portfolio of human demonstrated behaviours /activities. The value of this indicator, SSI, was defined as the proportion of the socially orientated activities to that of other observed activities. The detailed classification of activities has been discussed in Chapter 5 and can be seen in Appendix Table 3.3.

Table 8.1 Indicators for Social networks appraisal

'Social Network' Indicators	**Data collection**	**Initial data**	**Transformed data, if applicable**
8.1 Sense of Belonging	Questionnaire	Likert scale, the ranks of sense of belonging	
8.2 Perception of neighbourhood character	Questionnaire	Likert scale, the ranks of neighbourhood character	
8.3 Neighbour mutual recognition	Questionnaire	Interval scale, the numbers of recognized neighbours	
8.4 Neighbour mutual helpfulness	Questionnaire	Likert scale, the ranks of neighbour mutual helpfulness	
8.5 Social group participation	Questionnaire	Interval scale, the numbers of joined groups	
8.6 Length of time spend on activities	Questionnaire	Interval scale, the durations of inside-neighbourhood activities	
8.7 Subjective willingness to participate in activities	Questionnaire	Interval scale, the durations of outside-neighbourhood activities	Interval scale, the ratio of inside activities to outside activities
8.8 Objective frequency of interaction	Observation	Interval scale, the numbers of observed outdoor activities	The observed activities per capita
8.9 Spatial Intensity of interaction	Observation	Interval scale, the numbers of observed outdoor activities	The observed activities per hectare
8.10 Social strength of interaction	Observation	Interval scale, the observed numbers of types of activities	The proportions of social oriented activities

To analyse the variances between five typical neighbourhood patterns, statistical analysis with SPSS were conducted to the appraisal results. Seven indicators were self-assessed in the questionnaire survey. For this type of data, analytical methods similar to those applied in Chapter 7 were again utilised to test whether the outcome was significant among the whole population. The one-way ANOVA approach had to include some further enhanced tests (the Welch ANOVA and Games-Howell tests) due to some inequities appeared regarding data homogeneity (in this case, an inequity of standard deviation was also suggested by the Levene's test, $p<.05$, Appendix Table 4.8). The two repeated observations of social interaction were undertaken recording neighbourhood-based outdoor activities. Results were also compared by the paired T- test to examine the stability of the two measurements. In the assessments of the observed frequency (OFA) and spatial intensity (SII) of social interactions, the means of the two measurements were eventually adopted, because no statistically significant difference existed between the two measurements ($T=1.487$, $p=.211$, Appendix Table 4.12). Similarly, the value of social strengthen of interaction also came from the mean of the two measurements, between which no

significant variation was found (T=1.258, p=.277, Appendix Table 4.12). Following the social-spatial nexus described in Chapters 2 and 3, correlation analyses were applied to test the potential impact of urban form variables in relation to social cohesion and social interactions at the neighbourhood level. Linkages with social-demographic factors were also discussed at the individual level considering their potential impacts on the development of social networks inside neighbourhoods.

8.2 The 'social network' appraisal result for the entire research area

The three indicators that were measured by the 5-point Likert scale (sense of belonging, neighbourhood character, neighbour mutual helpfulness) have all received a positive result (M>3.0, Appendix Table 4.7). Firstly, neighbourhood sense of belonging, which has been described as a kind of feeling of home (Liu, 2014), was generally found to be strong, because the result received in this assessment had a mean score of 4.0 (SD=1.011). This outcome did not directly comply with some researchers' claims (He and Wu, 2007, Wu et al., 2010) on a recent deterioration in the sense of belonging in modern Chinese neighbourhoods. In contrast, this result indicated that a generally strong sense of belonging still exists in urban Shenzhen neighbourhoods, despite its distribution across neighbourhoods may not be even. Some studies (Xu, 2009, Non, 2009) had also implied that the character of modern Chinese cities has declined and become relatively indistinctive, even for its own inhabitants. However, this was not found in this study. Although not as highly ranked as the other two indicators, the perception of neighbourhood character was still generally neutral among the residents (M=3.00, SD=1.240). There was also a positive perception regarding the helpfulness of neighbours (M=4.07, SD=.899), which was suggested to be beneficial to shaping strong neighbourhood social ties. This indicates that the inhabitants of Shenzhen are in agreement concerning the significance of neighbours and social relationships inside neighbourhoods.

The remaining seven indicators were assessed using the interval scale data (Appendix Table 4.7). The number of recognised neighbours was over 20 on average among all participants (M=23.34, SD=17.255). Against the researcher's expectation, a decent neighbour relationship might have been shaped among inhabitants, according to the tangible mutual identification and the above-stated agreeable mutual helpfulness. For social group participation, about one out of two participants had a membership of a social group

(M=0.48, SD=0.891). The average time spent by participants on neighbourhood-based outdoor activities was about 1 hour per day (M=58.14, SD=43.32) whilst other activities outside neighbourhoods took only about 40 minutes in a day. The other three objective assessments of neighbourhood activities were all perceived by on-site observations. Within the thirty-minute observation period, the frequency of activities in the entire observation area was about 0.05 per capita, which means that five people out of 100 had taken part in outdoor activities inside their neighbourhood. Based on the same recording period, the spatial intensity of activities was 38 individuals per hectare. Furthermore, among all these observed activities, the occurrence of strengthened social activities was 1.5 times that of other non-social activities in the entire research area, indicating positive social interactions exist among local residents. The above results together indicate that local residents appeared to have generally strong social interaction inside their neighbourhoods.

8.3 Variations between the different neighbourhood patterns

8.3.1 Sense of belonging (SOB)

Sense of belonging (SOB) is a widely embraced 'community-based' concept and a core part of social sustainability (McMillan and Chavis, 1986, Li, 2008). Figure 8.1 shows the initial assessment outcome of SOB among the five types of neighbourhoods. As investigated by the case study, a large proportion of participants reported high levels of a 'sense of belonging'. The positive responses, including perceptions in either 'strong' or 'very strong' categories, reached 91.25% in LSMD, 83.33% in MSHD, 80.56% in MSMD and 90.00% in MSLD. The sense of belonging in SSHD, however, seemed to be depressing, as only 43.75% of its participants had a positive feeling. To be more precise, the ANOVA test that analysed the 5-point Likert scale data suggested a significant variance among the five groups (Welch $F(4, 88.831)=7.966$, $p=.000$, Appendix 4.8). LSMD (M=4.30, SD=.818), MSMD (M=3.94, SD=.924), MSHD (M=4.00, SD=.968) and MSLD (M=4.30, SD=.750) received high scores and had no significant differences ($p>0.05$), but the result of SSHD (M=3.03, SD=1.231) was found to be statistically lower than others ($p<.05$) in the post hoc test (Games-Howell, Appendix Table 4.9).

According to the above evidence, most urban neighbourhoods have a strong sense of belonging in reality, except that of the SSHD neighbourhoods may be relatively weaker. A strong sense of belonging is widely regarded as the foundation of a socially sustainable community (Edge and McAllister, 2009, Flint, 2011), because it has a large role which leads

to the formation of inner common values and generates wide cooperation among inhabitants. During the interviews and questionnaire surveys, a sense of place as a kind of feeling of 'home' was commonly accepted by most residents to be indispensable and crucial. Some residents have stayed in their neighbourhoods for years (the average length of residence was 7.4 years in this case study). Hence, a generally amiable sense of belonging may have been shaped intrinsically with their length of stay and their years of efforts in managing their homeland, despite the various differences between each neighbourhood. Moreover, the relationship between the SOB and urban form is also suggested to be crucial (Wood et al., 2010, Francis et al., 2012). The assessment result, however, reminds us that the small-scale, high-density neighbourhood pattern in China may have an inherent disadvantage in that it hinders the building of a sense of belonging, which may call for attention for urban policymakers.

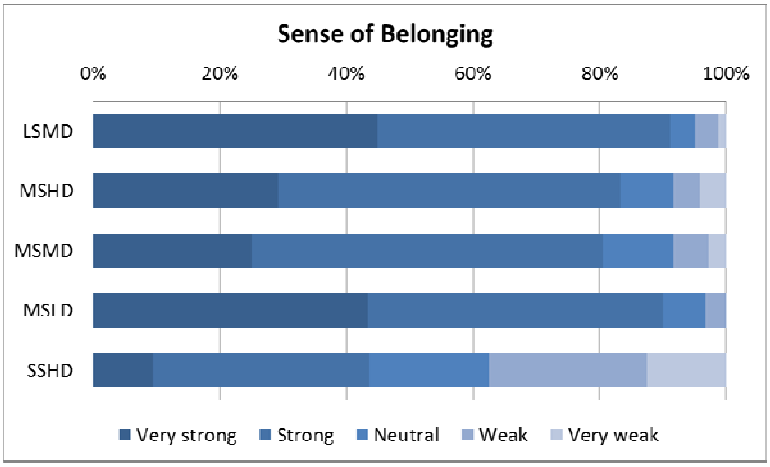

Figure 8.1 The result of neighbourhood sense of belonging by the five forms

8.3.2 Perception of neighbourhood character (PNC)

Figure 8.2 describes the results of the perceived neighbourhood characters in the five different groups. The LSMD was the highest rank, as 73.75% participants identified their neighbourhoods as unique (either distinctive or extremely distinctive). The proportion of positive responses was 55.56% in MSMD; however, it dropped to 27.08% in MSHD, 20.00% in MSLD and further decreased to only 18.75% in SSHD. A meaningful group-variance (Welch $F(4,87.017)=25.456$, $p=.000$) was revealed by the enhanced one-way ANOVA analysis (Appendix Table 4.8). Multiple comparisons in the post hoc test (Games-Howell) showed that the mean scores of LSMD ($M=3.79$, $SD=.896$) and MSMD ($M=3.33$, $SD=1.095$) were both significantly higher ($p<0.05$, Appendix Table 4.9) than MSHD ($M=2.50$, $SD=1.072$), MSLD ($M=2.30$, $SD=1.088$) and SSHD ($M=2.06$, $SD=1.190$). Thus, significant at the $p=0.05$ level, there is a great likelihood that the patterns of LSMD and MSMD have exceedingly

distinctive characters in the recent massive urban neighbourhood development. In contrast, the SSHD appears to be mediocre; that is, it is losing an attractive identity in the torrent of neighbourhood construction. Traditionally in China, the character of neighbourhoods may only refer to the spatial characteristics generated by their unique architectural styles or the attractiveness created by high-quality public spaces. However, according to 'place-making' theory (Bohl, 2002, Røe, 2014), neighbourhood character can be shaped by both physical and non-physical assets. In recent academic research and planning practices (Davison and Rowden, 2012, Greater London Authority, 2013), the character of a neighbourhood is illustrated as not only originating from unique buildings and public squares, but also as being created by people and activities. It further indicates a potential socio-spatial linkage that may exist inside neighbourhoods; for instance, an idiosyncratic and memorable place can be created for residents by shaping a high-quality public corner where various organised collective events take place.

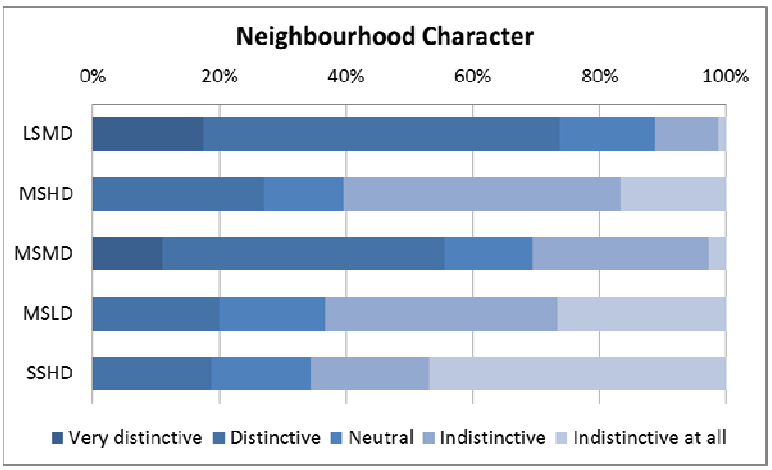

Figure 8.2 The perception of neighbourhood character by the five forms

8.3.3 Neighbour mutual recognition (NMR) and neighbour mutual helpfulness (NMH)

A strong social bond could not be shaped without a knowledge of neighbours and thus a mutual recognition can be seen as an initial phase of building social networks (Buys and Miller, 2012, Day, 2010). In this assessment, the two highest scores were from MSLD and MSHD (Figure 8.3) and their respondents reported having 31.4 and 30.5 neighbours on average, respectively. The mean score was less in LSMD (M=21.7) and MSMD (M=21.1), and was even lower (M=11.9) in the SSHD. A statistically significant group variance was discovered in the ANOVA test (Welch F (4, 92.819) =12.985, p=.000), and this was due to the SSHD's significantly lower score comparing with the other four groups (p<.05, Appendix Table 4.9). Significant at p=.05 level, the evidence suggests that residents in the type of

SSHD neighbourhood are much likely to know less about their neighbours than residents in the other neighbourhood types. However, it is still surprising to see the outcome that mutual recognition is lower in these super high-density neighbourhoods, where people are supposed to be accommodated geographically closer to each other. However, in another high-density group, MSHD, the mutual recognition was discovered to be strong. This indicates that the impact of density could be controlled in a reasonable degree. Other influential factors may be from social demographic features; for example, in the SSHD neighbourhood there seems to be a larger floating population, for whom the neighbour relationship is suggested to be more indifferent (Kennedy, 1984). As this is related to the topic of social stability, further specific discussions will be provided in Chapter 9.

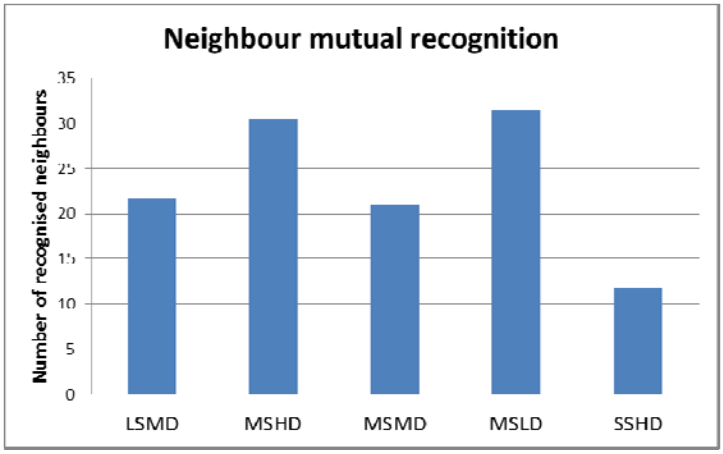

Figure 8.3 The result of neighbourhood mutual recognition by the five forms

The perception of neighbour mutual helpfulness (NMH) is another indicator assessing the development of social cohesion. In addition to recognising people living together, a more amicable social relationship inside neighbourhoods could make inhabitants more willing to offer help to their neighbours, if necessary (Mata and Pendakur, 2013). The outcome for neighbour mutual helpfulness from the questionnaire survey shows that the five groups have all received positive scores (Figure 8.4). The proportion of affirmative responses, including both the answers 'important' and 'very important', was high in MSLD (86.67%) and MSMD (83.33%), and also decent in LSMD (77.50%) and MSHD (75.00%). Even in SSHD, 68.75% of participants valued the concept of neighbour mutual helpfulness. The ANOVA test indicated that the overall variation of the five groups was non-significant ($F(4,221)=1.661$, $p=.160$, Appendix Table 4.8). The neighbour mutual helpfulness is therefore respected by most residents of Shenzhen as essentially crucial, which may be implied as a commendable agreement on the meaning of developing neighbourhood social networks. In contrast to some research (Chen et al., 2010, Liu and He, 2007) criticising that mutual

friendship has declined in many modern Chinese neighbourhoods nowadays, the importance of mutual social relationships for residents is clearly found in this study.

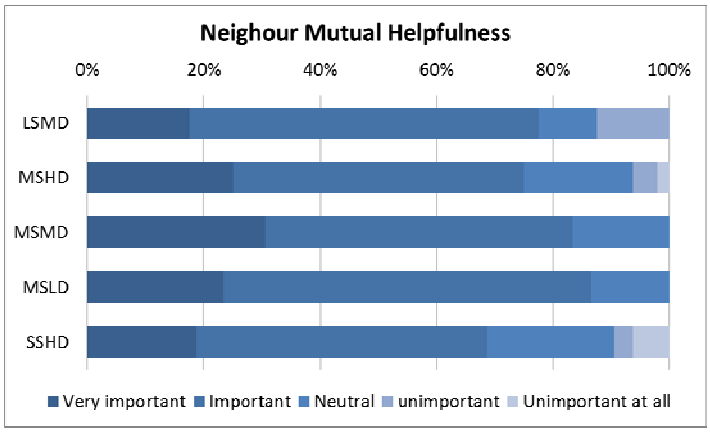

Figure 8.4 The result of neighbour mutual helpfulness by the five forms

8.3.4 Social Group Membership (SGM)

Organising social groups inside a neighbourhood greatly contributes to social cohesion by providing opportunities for creating activities and events and enhancing collaborations (Pinkster and Volker, 2009, Bakker and Dekker, 2012). A high level of social cohesion in a neighbourhood can be represented by the abundant number of social groups that develop among its residents. In this study, the indicator social group membership (SGM) was assessed from an individual perspective. Figure 8.5 shows the result of SGM in the five types of neighbourhood: 93.75% of respondents from the SSHD group reported that they did not join any social group inside their neighbourhoods. However, the non-participatory rate was only 73.33% in MSLD and 70.83% in MSHD. This was even lower in the other two neighbourhood types, at 66.67% in MSMD and 57.50% in LSMD. According to the enhanced ANOVA test, the overall group variation of SGM was statistically significant (Welch (4,92.002) F=9.764, p=.000). As SSHD had the lowest mark (M=.06, SD=.246), the differences between it and other three types of neighbourhood (except MSLD) were examined by the post hoc test (Games-Howell) and confirmed as significant ($p<0.05$, Appendix Table 4.9). The groups LSMD (M=.70, SD=1.011), MSHD (M=.33, SD=.559), MSMD (M=.56, SD=.877), and MSLD (M=.50, SD=1.225) received similar scores, which were non-significant between each other ($p>0.05$). Additionally, the study noticed a suspected outlier in LSMD as well as another in MSLD. The responses in the values of 5 and 6 seemed to be peculiarly high, as participants' answers to this survey were mostly between the range of 0 and 3. A similar research outcome still appeared after a Winsorising of the data detecting the influences of the outliers, which did not change the previous findings and especially did not affect the remarkable low score of SSHD in respect to the SGM. These outliers may not be errors but

just atypical results due to the limited sample size adopted in this research's sampling process.

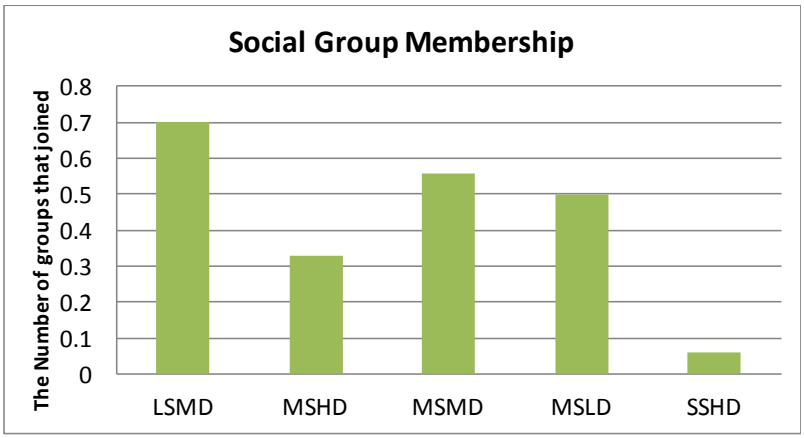

Figure 8.5 The result of social group membership by the five forms

It also is interesting to know in what types of social group the residents have participated inside their neighbourhoods. By interviewing several respondents, it was found that sports and cultural groups were popular among inhabitants. Many female respondents preferred to dance together near public spaces as a collective fitness class or sometimes a cultural event for the neighbourhood. A considerable amount of elderly people seemed to be enthusiasts of card or Mahjong clubs, which are currently popular in China. Interviewee F3 indicated that her group benefited the entire community development, in fact. 'Our group is a big family and people trust each other by a long-time partnership and friendship, and this is absolutely further than the basic relationship that we live here together.' Many inhabitants also indicated that their memberships not only satisfied their need to take various kinds of activities but also established their social networks. In contrast, a resident from SSHD-1 told the researcher that she was highly envious of the activities in LSMD-1; however, she felt that there was currently no group that she could join inside her neighbourhood. A conclusion from comparing the variation of SGM is that it is highly possible that residents from the SSHD neighbourhoods are meeting some difficulties in developing neighbourhood-based social groups.

8.3.5 Subjective willingness to participate in activities and length of time spent (SWP, LTS)

The frequency of outdoor activities has been widely adopted in assessing neighbourhood social interaction, which is also suggested to be associated with both the environmental and social determinants (Coughenour et al., 2014). The indicator length of time spent (LTS) on neighbourhood-based activities represented the individual perception of the duration of

daily outdoor activity (in minutes). Another indicator, subjective willingness to participate in activities (SWP), reflected how inhabitants valued their neighbourhood-based activities. This first required a measurement of the length of time spent on outer-neighbourhood activities as well, but the value of SWP was eventually calculated by the ratio of the two time-scale datasets, to be more precise, the willingness to participate was reflected on the proportion of time spent on inner-neighbourhood activities compared to the time spent on outer-neighbourhood activities. As the data was acquired from the questionnaire samples, it was necessary to conduct appropriate statistical tests for the analysing results of LTS and SWA and their variations regarding the different neighbourhood patterns.

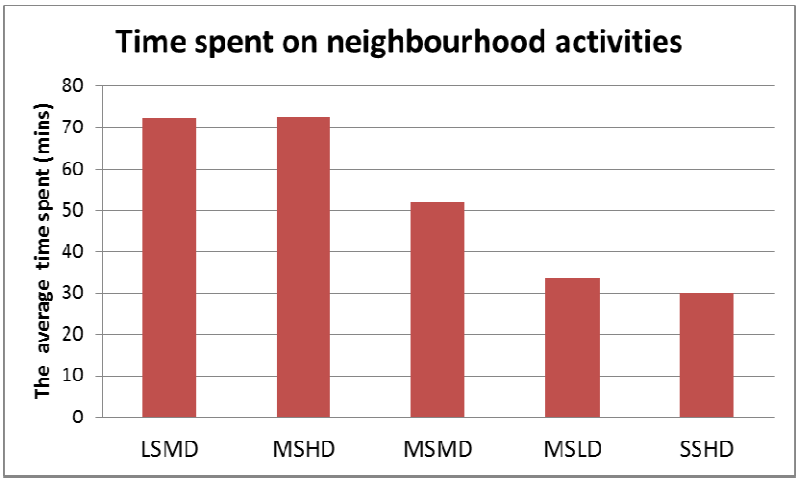

Figure 8.6 The result of LST assessment by the five forms

Obviously from the assessment of LTS (Figure 8.6), participants from LSMD (M=72.469, SD=.38.870) and MSHD (M=72.656, SD=49.993) reported longer durations of neighbourhood-based activities, which were all over 70 minutes in a day. The average time spent fell to 52 minutes in the MSMD group (M=52.083, SD=34.6694) and was further reduced to only about 30 minutes per day in MSLD (M=33.750, SD=36.782) and SSHD (M=30.234, SD=32.857). The ANOVA test revealed a generally significant variance among the five groups (Welch F (4,92.408)=12.379, p=.000). Additionally, the post hoc (Games-Howell) multiple comparisons suggested that the results of the top two groups (LSMD, MSHD) were significantly higher ($p<.05$, Appendix Table 4.9) than the bottom two groups (MSLD, SSHD). Moreover, the middle-ranged MSMD was also statistically lower than the leader, LSMD ($p<.05$).

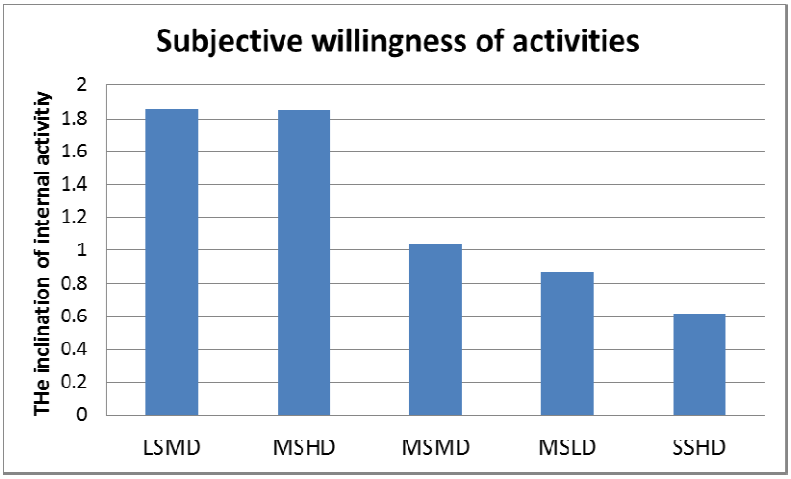

Figure 8.7 The result of SWP assessment by the five forms

An extremely similar outcome appeared in another assessment of SWP (Figure 8.7). The respondents' intention to take inner-neighbourhood activities was also high in two neighbourhoods, LSMD (M=1.858, SD=2.0149) and MSHD (M=1.853, SD=3.2514), where the dominant types of activities were all inner-neighbourhood based. The situation was the opposite in the MSLD (M=0.869, SD=1.3326) and SSHD (M=0.615, SD=1.2068) groups, as here residents would mainly prefer to go outside for activities. The general group variation was again confirmed as significant (Welch F(4,97.378)=4.891, p=.001). Compared with LSMD, the preference for neighbourhood-based activities in SSHD and MSLD was also significantly lower (p<.05, Appendix Table 4.9). Therefore, at the 95% confidence level, the subjective willingness to participate in activities and the length of time spent in neighbourhoods of MSLD and SSHD are evidently lower than in the LSMD. A participant in SSHD-1 neighbourhood, who was a public dancing enthusiast, told the researcher that she usually danced at a nearby public square in front of the Houhai Baoli theatre instead of staying in her neighbourhood, which she felt was 'greatly annoying, because of a significant lack of available outdoor spaces and therefore not ideal for a group work'. Thus, an obvious inequality still occurs in terms of social interaction as seen in the current high spatial variation in urban neighbourhoods of Shenzhen. Enhancing neighbourhood interactions would be of great meaning for many neighbourhoods in Shenzhen that have a similar predicament in reality.

8.3.6 Observed frequency and spatial intensity of interaction (OFI, SII)

Aiming to understand how frequently outdoor activities occur among a population, the observed frequency of interaction (OFI) was compared by per capita activities occurring (Appendix Table 4.11). Another similar indicator, the spatial intensity of activities (SII),

represented the possibility of activities occurring in relation to neighbourhood space. The value of each indicator was also confined to a certain observation period, 30 minutes in this assessment. Figure 8.8 shows the OFI assessment results for activity frequencies among the five different types of neighbourhoods. The LSMD (M=5.846%) and MSMD (M=5.590%) groups received highest frequencies, with more than five people out of 100 having taken outdoor activities during the observed period. Relatively lower frequencies occurred in MSLD (M=3.217%) and MSHD (M=2.946%), whilst the lowest score was from SSHD (M=0.698%), which appeared to be greatly different among these groups. Comparing the subjective and the objective assessment results, it is clear that the inhabitants of LSMD have a consistently high frequency of participation in outdoor activities. In contrast, taking outdoor activities seems to be relatively infrequent among the residents of SSHD.

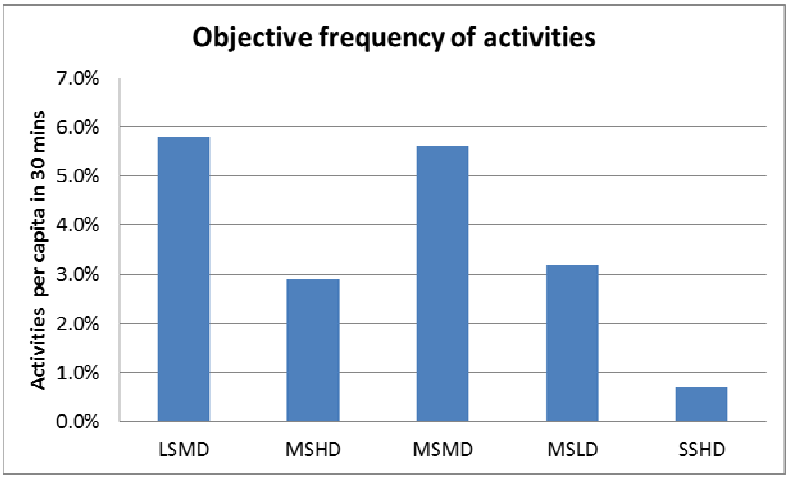

Figure 8.8 The result of OFI assessment by the five forms

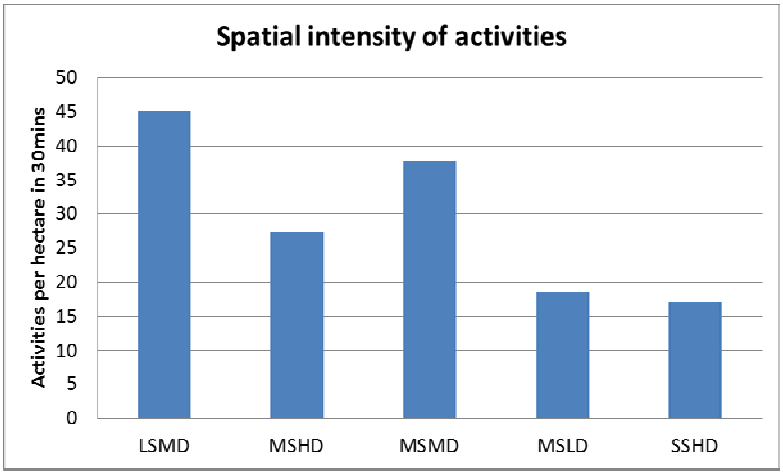

Figure 8.9 The result of SII assessment by the five forms

The outcome of SII, the spatial intensity of activity, is demonstrated in Figure 8.9. Comparing the results of each type of neighbourhood, it was evident that the LSMD group again reached the highest score (M=45.152) and the two groups MSMS (M=37.812) and

MSHD (M=27.228) were at the intermediate level. The lowest intensity was found in the groups of SSHD (M=17.137) and MSLD (M=18.538). The two assessments of OFI and SII together indicated the potential influence of urban density on this factor. Although they appeared to be slightly different from each other, the results of OFI and SII in this study consistently suggest that neither high density nor low density is effective in promoting outdoor activities. There has been some research (Boyko and Cooper, 2011, Zhou et al., 2013) asserting that a higher density would promote greater social interaction; however, this did not occur in this case. A similar negative association has also been reported by other studies (Xu et al., 2010). That a high occurrence of activity does not appear in the low-density neighbourhood either is also in contraction with some previously plausible assumptions on the contented impression of the low-density environment (Su et al., 2014). This study gives evidence that these assumptions may not be true in relation to certain low-density neighbourhoods in Shenzhen, where their environment may have greatly declined recently. The evidence here mostly indicates that the highest level of outdoor activities, both demographically and geographically, appeared in medium-density range neighbourhoods. However, further explorations on the role of density and other urban form factors are still necessary regarding the above complex results and the emerging academic disputes.

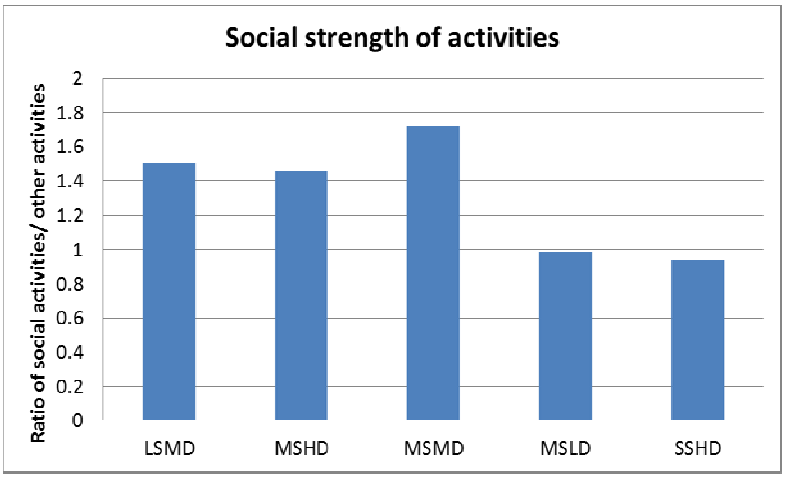

Figure 8.10 The result of SSI assessment by the five forms

8.3.7 Social strength of interaction (SSI)

As already stated in Chapter 4 and Chapter 5, a significant diversity exists in people's daily outdoor activities. The two general categories, self-oriented optional activities (OA) and group-oriented social activities (SA), are both meaningful activities in this study. However, compared with the sort of optional activity, which could be described as 'individual or family-led activities', the type of social activity is more beneficial for improving the quality

and quantity of the entire neighbourhood interactions (Gehl and Gemzoe, 2004). The examination of the social strength of interaction (SSI) was based on the acquisition of the portfolio of the observed activities and identification of the orientations of these activities, using the ratio of observed social activities to other activities (Appendix Tables 4.10-4.11). Figure 8.10 demonstrates the final result of SSI, in which the general strengths were all in the range of 0.9 to 1.8. Three groups, MSMD (M=1.72), LSMD (M=1.50) and MSHD (M=1.46), received stronger scores than the other two, MSLD (M=0.99) and SSHD (M=0.94), which had weak scores. Clearly, there were dominant social interactions in the first three groups, and, therefore, the variation among different neighbourhood patterns still exists. However, the gap in terms of the social strength of interaction is not as large as the previous assessments of OFI and SII, in which the gaps between the top and bottom were almost tripled or even quadrupled (see Figures 8.8 and 8.9). Social interaction is described as 'adaptation at the individual level and socialisation in groups' by Doi et al. (2008, p.1109), and can significantly contribute to the development of social networks by connecting them together through different kinds of cooperation and creating various happenings and events (Gehl, 1971, Can, 2012). As a result, the desire to make social contacts seems to be a common value and a kind of natural human need. As an intrinsic feature of a community, the orientation of socially inclined behaviour may not be overthrown by external factors.

8.3.8 The overall appraisal results and sustainability indices

A standardisation of the above results was required, especially considering the varied measurements and data ranges in these assessments. The Z-score method was again applied, transforming all the results of indicators into a standard range (between -2 and 2). The whole image of the appraisal of neighbourhood social network is shown in Table 8.2 and visualised in Figure 8.11, by which both advantages and disadvantages of each group can be clearly identified. It was apparent that the LSMD group received the best score in this assessment (M=0.729). Overall positive results were found in two other types of neighbourhood, MSMD (M=0.456) and MSHD (M=0.209). By contrast, the SSHD (M=-1.257) and MSLD (M=-0.137) were both discovered to be negative, and were judged to be unsustainable forms with respect to the development of neighbourhood social networks. Especially, the form of SSHD was suggested to be the worst regarding its constantly appeared negative results in each individual assessment. There is also a consistency between the overall results of social cohesion outcome and the social interaction in most types of neighbourhood. The MSLD, however, is an exception. A contradiction was seen in its considerably high score in social cohesion (M_1=0.450), providing a different scenario in

respect to its negative social interaction (M_2=-0.725). As a result, there might be more factors that could affect the entire outcome of social networks. This has to be further explored by discussing the spatial and social characteristics of neighbourhoods as well as their potential nexus.

Table 8.2 Social sustainability index II: Z-score results for the layer of 'Social Networks'

Form	SOB	PNC	NMR	NMH	SGM	LTS	SWP	OFI	SII	SSI	Overall
LSMD	0.740	1.356	-0.203	-0.630	1.099	.995	1.061	1.031	1.314	0.522	0.729
MSHD	0.165	-0.404	0.899	-0.124	-0.407	1.005	1.052	-.336	-.160	0.405	0.209
MSMD	0.050	0.729	-0.278	1.113	0.529	-.008	-.358	.911	.710	1.167	0.456
MSLD	0.740	-0.677	1.014	0.889	0.285	-.910	-.657	-.209	-.874	-0.973	-0.137
SSHD	-1.695	-1.004	-1.430	-1.248	-1.506	-1.083	-1.098	-1.397	-.990	-1.120	-1.257

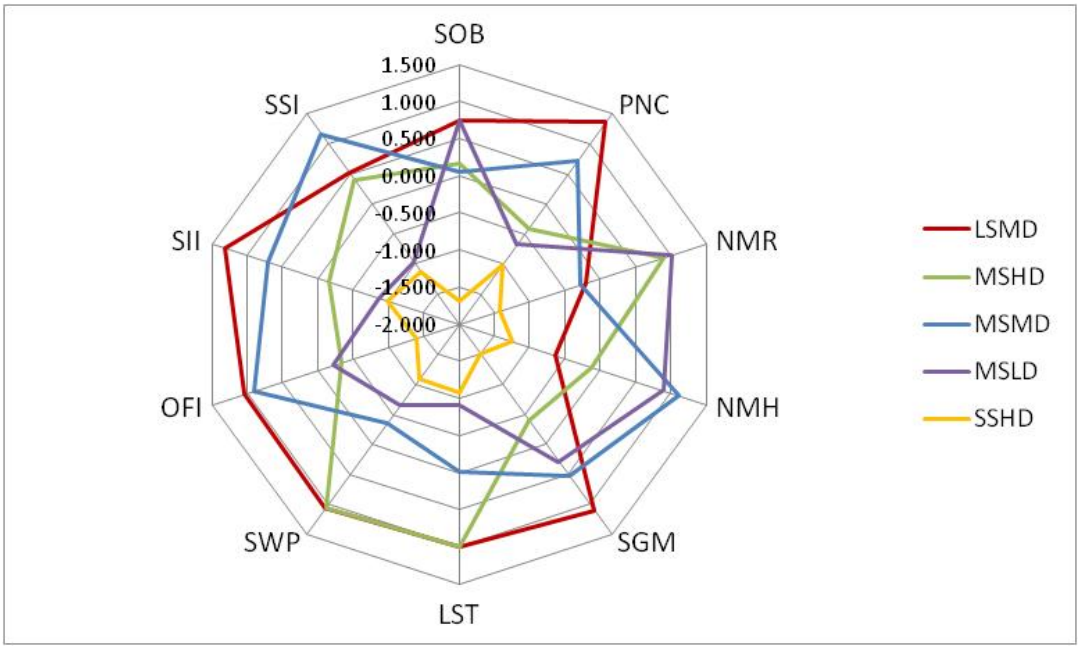

Figure 8.11 The comparison of the development of social networks among the five types of neighbourhoods

8.4 Reflections on the current planning system

8.4.1 Understanding the impacts of the urban form

Juxtaposed with the finding of Chapter 7, it is clear that there is a continuing imbalance in the development of social networks in the current spatial patterns of Shenzhen neighbourhoods. Further correlation analyses were indispensable to clarify the influence of the urban form and its potential nexus with social networks at the neighbourhood level. The variable **site scale** was suggested to be a **positive** factor for developing social networks, which could be observed in relation to all 10 indicators (Table 8.3). Its impact was especially significant on the perception of neighbourhood character (R=.692, p=.026) and social group

membership (R=.800, p=.005). Another variable, **building coverage ratio** (BCR), as discussed before, could be a potential critical factor but has not been given a great amount of consideration by academics or practitioners. However, evidence of this appraisal indicates its considerable **negative** impacts on the development of social networks inside neighbourhoods, and this is particularly obvious in relation to three indicators: sense of belonging (R=-.701, p=0.024), developing social group membership (R=-.762, p=0.01) and length of time spent on neighbourhood activities (R=-.718, p=0.019). The explanation for the negative role of BCR is that a higher building coverage ratio means a lower outdoor space ratio for a neighbourhood, considering its commonly enclosed features appear everywhere in the country. The lack of provision of sufficient outdoor sites and playgrounds, as a result, would further reduce the possibility of generating social interaction inside neighbourhoods. The above evidence again encourages the pattern of large and medium neighbourhoods, as the relevant sufficient outdoor open space could, to some degree, promote the shaping of social cohesion inside neighbourhoods.

Table 8.3 Person's correlations: urban form variables and social networks indicators

Urban Form	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	8.10
variables	SOB	PNC	NMR	NMH	SGM	LTS	SWP	OFI	SII	SSI
Site scale	0.465	**.692***	0.077	0.015	**.800****	0.572	0.419	0.518	0.482	0.276
Sig. (2-tailed)	0.176	0.026	0.832	0.967	0.005	0.084	0.228	0.125	0.158	0.44
BCR	**-.701***	-0.552	-0.598	-0.28	**-.762***	**-.718***	-0.621	-0.566	-0.283	-0.617
Sig. (2-tailed)	0.024	0.098	0.068	0.433	0.01	0.019	0.055	0.088	0.428	0.058
FAR	**-.752***	-0.494	-0.537	-0.601	**-.685***	-0.288	-0.303	-0.581	-0.212	-0.448
Sig. (2-tailed)	0.012	0.146	0.11	0.066	0.029	0.42	0.395	0.078	0.557	0.194
D_P	**-.831****	-0.546	-0.601	-0.551	**-.693***	-0.543	-0.441	-0.575	-0.248	-0.574
Sig. (2-tailed)	0.003	0.103	0.066	0.099	0.026	0.105	0.202	0.082	0.489	0.083

(N=10) ** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Some negative social effects have been suggested (van den Berg et al., 2010) for people living in high-density urban areas. This study also confirmed this point, as the variable **FAR** expressed a coherently **negative** influence on the development of social networks throughout the 10 assessments and was extremely significant for sense of belonging (R= -.752, p=-0.012) and social group membership (R=-.685, p=.029). The variable **population density** (Dp) had the same negative effects due to its strong linear relationship with the variable FAR (see Chapters 4 and 6). Firstly, the above findings crucially indicate that a considerable uncertainty exists in the currently prevalent high-density mode, and there is a big question regarding whether it could embrace a decent social cohesion of

neighbourhoods in reality. The creation of this neighbourhood pattern may be due to the limited urban land resources and high pressure from the influx of a large number of urban migrants. However, the opportunity of building robust neighbourhood social networks seems to be weakened under this form. Without thorough introspection and further remediating actions, the continuous urban intensification in Shenzhen and in China as a whole would be far from a really sustainable pattern and problematic for the country's future long-term development. Secondly, with regard to the role of density, it was previously suggested by research literature and planning practice (Hamnett, 2011, Tong and Wong, 1997) as greatly positive and beneficial for sustainable development; however, the assumed advancement in developing social sustainability does not appear in the case of Shenzhen. The controversy regarding the role of density, therefore, can be seen, which has also been initially discussed by certain authors (Burton, 2000, Geng, 2008). A universal conclusion on the role of density may not exist, in fact. The formulation of planning strategies for the Chinese neighbourhood has to be based on a thorough analysis of the unique local urban context rather than simply following some inapplicable strategies generated by theory or other different urban backgrounds.

As an essential characteristic of a successful neighbourhood, vital social interactions can significantly contribute to weaving social ties and developing social networks (Kaźmierczak, 2013, Dempsey et al., 2012a). However, except for the nexus between the length of time spent on neighbourhood-based activities and building coverage ratio (R=-.718, p=.019), no strong association between urban form variables and the indicators of neighbourhood interaction is an unanticipated finding in this study. Three clarifications could be made as further explanations for this outcome generated by a complicated assessment. Firstly, the above result could confirm that there is no direct impact coming from density. There are supportive studies with a similar allegation; for example, Forsyth et al. (2007) claimed that higher densities alone do not appear to be the silver bullet to increase physical activity. Secondly, a strong positive impact could be rediscovered from the variable site scale after excluding an outlier from case LSMD-1, the value of which was extremely large (13.75ha). The indicator objective frequency of interaction was then in a strong linear relationship with site scale (R=0.927, p=.000) and so was the spatial intensity of interaction (R=0.780, p=.013). This correlation may not be strong for all the neighbourhoods and could become weak with the increase of the neighbourhood scale. However, this partial impact could still be an important reference that works for many neighbourhoods (in this study for the cases below

7 ha). Finally, it may be assumed that the mechanisms of impacting human activity would be more than complicated and their determinants could be multidimensional; for example, as Cerin et al. (2013a) discovered, the walking path conditions inside neighbourhoods may also be a factor. However, the nature of interaction, according to the discovery in this study, appeared to be solid among inhabitants of Chinese neighbourhoods. The evidence for this comes from the considerably high strength of socially oriented activities among all the neighbourhoods (ratio above 0.9, see Figure 8.10), no matter whether their spatial condition is ideal or not. Moreover, the impact of urban form variables on social relationships of residents appear to be limited. Evidence is that the levels of neighbour mutual recognition and helpfulness are also not associated with urban form variables. This may bring into question some related literature (Talen, 2010, Gordon and Vipond, 2005) which in many ways suggested that the urban form had a noteworthy impact on human activity. Current planning strategies, which also greatly emphasise the spatial regulations, may need to consider more external forces beyond the traditional focus on the urban form, especially with the lengthwise development of social sustainability. In addition to the spatial factors discussed above, the role of some endogenous social-demographic factors may also be essential in relation to social cohesion and social interaction (Zegras et al., 2012), as detailed in the following section.

Table 8.4 Spearman's correlations: social-demographic variables & social networks indicators

		SOB	PNC	NMR	NMH	SGM	LST	SWP
Age	Coefficient	0.099	-0.039	.199**	0.071	0.107	.180**	0.117
	Sig. (2-tailed)	0.139	0.557	0.003	0.285	0.108	0.007	0.080
Household Member	Coefficient	0.074	0.038	0.027	0.051	0.118	0.100	0.027
	Sig. (2-tailed)	0.271	0.569	0.682	0.448	0.076	0.133	0.690
Length of Residence	Coefficient	.300**	-.170*	.472**	.177**	0.059	0.051	0.066
	Sig. (2-tailed)	0.000	0.012	0.000	0.008	0.381	0.448	0.331
Education background	Coefficient	0.036	0.107	-.188**	-0.046	-.157*	-0.023	-0.005
	Sig. (2-tailed)	0.587	0.108	0.005	0.488	0.018	0.728	0.945
Income	Coefficient	-0.022	0.076	-0.076	-0.049	-.145*	0.011	0.032
	Sig. (2-tailed)	0.745	0.256	0.255	0.466	0.029	0.871	0.631

N=226, except N=220 for length of residence; ** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

8.4.2 Understanding the social-demographic impacts

At the individual level, demographic factors were found to have some correlations (Table 8.4) with the social network development. Generally speaking, the association between demographic feature and social network is not strong. However, the length of residence is

revealed to be associated with their sense of belonging (R=.300, p=.007) and mutually recognised neighbours (R=.472, p=.000). Hence, sense of belonging and neighbour mutual recognition would all increase with a longer residence. It also indicates future neighbourhood growth would be of great meaning for people in long-term residence, and especially important for them to maintain social identification and local ties. However, a relatively negative perception of neighbourhood character may occur with a long period stay. A possible explanation for this might be that the perceived attractiveness of the neighbourhood would gradually fade away with the length of stay as a kind of psychological resistance (Rogaly and Taylor, 2011). Higher educated and high-income level households were indicated by some scholars (Douglass et al., 2012) to have limited communications and cautious social bounds inside neighbourhoods. This situation is found in this study, but their association is not as strong as indicated in literature. In summary, similar to the weak nexus discovered in Chapter 7 on the basic needs satisfaction, the demographic features of neighbourhood residents may not direct impact the social network development.

8.4.3 The interweaving of socio-spatial networks inside neighbourhoods

The occurrence of social networks inside neighbourhoods has been explained as having various benefits for enhancing social sustainability: for instance, to promote social solidarity, to avoid isolation and segregation, to decrease crimes and violence, and to shape common values and civic culture (Robinson, 2005). The important relationship between planning and design of neighbourhoods and shaping positive social networks has been highlighted in many studies worldwide (Raman, 2010, Colantonio and Dixon, 2011). Furthermore, the use of inner-neighbourhood public facilities has also been found to be linked with the level of interaction among residents (Ahlbrandt, 1984). Some research also demonstrates the issue that social interaction may be weak in certain patterns of urban form; for example, ‘the phenomenon of social withdrawal among the residents of urban high-rise living in Taipei’ (Huang, 2006, p.201).

To move forward, how to effectively enhance the social cohesion and social interaction for urban neighbourhoods is a big challenge for urban planners in China and the world. Firstly, a review of the physical input is still indispensable. This is because human relationships are ‘threatened in part by the physical design of neighbourhoods that are not conducive to social interactions’ (Semenza and March, 2009, p.22) and ‘when we design our neighbourhoods, the built environment can encourage interaction or hinder it’ (Jackson et al., 2012.p.38). However, as discussed in section 8.4.1, many controlling variables of urban

form seem to be uncorrelated with the social interaction inside neighbourhoods. However, a closer relationship is found in neighbourhood public space, which is strongly associated with both the subjective and objective assessments of social interaction ($p<.05$, Table 8.5). Undoubtedly, the meaning of public space to neighbourhoods has been greatly emphasised by studies (Marans and Loukaitou-Sideris, 1999, Stauskis and Eckardt, 2011) and also has been elaborated in Chapter 7. Neighbourhood social interactions, such as face-to-face chats, are more likely to take place in an outdoor environment (van den Berg et al., 2010), and thus could be greatly influenced by the quality of public space. In the case study, a lot of observed social interactions took place in many outstanding public spaces where pedestrian-friendly walkways and waterfront areas have been deliberately designed to form part of the space (Figures 8.12 and 8.13). Traditionally, a viable intervention is indicated by a successful urban design (Koohsari et al., 2013, Huang, 2006). It is from the perspective that a vital space can generate a vital social atmosphere to facilitate and promote social interaction. Although this relationship may not be absolutely causal, the occurrence of social activities could be diminished if confronting the reverse, poor spatial quality. Thus, a planning intervention by strengthening public space could be firstly considered as a neighbourhood foundation for encouraging outdoor activity. People communicate and build up social contacts, which also in turn enhances the community identity and social cohesion of neighbourhoods.

Figure 8.12 A pedestrian area with benches and the waterfront common area in LSMD-1

Figure 8.13 A waterfront public space in LSMD-1

Table 8.5 Correlations between neighbourhood-level public space satisfaction and outdoor activities

SF_PU	LTS	OFI	SII	SSI
Pearson's correlation	.737*	.783**	.799**	.788**
Sig. (2-tailed)	0.015	0.007	0.006	0.007

N=10; ** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Secondly, besides the physical intervention, social capital is also proved in this assessment to be beneficial to the development of social cohesion, the importance of which is also greatly encouraged by urban policies worldwide (Rajulton et al., 2007, Said and Yuliastuti, 2013). Simultaneously, the deterioration of neighbourhoods in many cases is found to be linked with the their loss of cohesion (Lemanski, 2006). However, according to the outcome of this appraisal, differences could be made by individual behaviours, such as the time spent on neighbourhood activities and the groups joined inside neighbourhoods, both of which were discovered to be strongly associated with the development of the entire social networks (Appendix Table 4.13) and thus can be regarded as important endogenous facilitators for neighbourhood social sustainability. This is from a bottom-up perspective in which interventions and encouragement could be accelerated by the internal social capital of neighbourhoods, such as by the self-elected committees and organised groups. They can replace some top-down governmental-led managements, which usually need high-level coordination between many different departments of local authorities. This implication complies with previous academic suggestions on improving social development (Sun, 2002) by cultivating community self-organised social groups. It provides a clue that developing social sustainability needs both the physical input and non-physical input, which are often interwoven inside a neighbourhood (Li, 2008). For instance, the enhancement of public realms can be a catalyst for cultivating social cohesion; meanwhile, the encouragement of participation in activities and groups can also bring benefits to a neighbourhood's

atmosphere and attractiveness. These cooperative efforts can together shape a more sustainable place.

8.5 Conclusion

In this chapter, a systematic appraisal of the layer of neighbourhood social networks was carried out by using two different research methods. A consistent conclusion can be drawn that the neighbourhoods in the LSMD and MSMD types are recommended because they have overall advantages for developing social networks; in contrast, the SSHD pattern that appears with many disadvantages should not be encouraged. Further evidence has explained some impacts of the urban form. The high-density development mode, therefore, needs further control of its negative influences, together with regulation of its co-variables, especially with regard to retaining the available outdoor open space for gated neighbourhoods. From a long-term consideration, a conscious effort to reduce the current social inequity has to be made. However, the traditional physical intervention would only have partial validity for the promotion of social networks inside neighbourhoods, as the influence of the urban form is indicated to be limited in a certain extent. Attention also needs to be paid to the growth of social capital inside neighbourhoods and wider cooperation at upper levels of urban governance. As they relate to another dimension, these will be further discussed in the next chapter, which is the appraisal of the layer of ‘community development’.

9. SOCIAL SUSTAINABILITY APPRAISAL: THE LAYER OF 'COMMUNITY DEVELOPMENT'

This chapter focuses on the final appraisal of the layer 'community development'. Social stability and neighbourhood governance are the two key themes of this layer. The major part of this chapter, similar to the previous two chapters' discussions, compares the variances of community development that possibly existed among different types of neighbourhood after a general report on the appraisal result for the entire case study area. The role that urban form plays in potentially influencing community development is also discussed. The latter discussion of research findings focuses on whether the previously observed social inequity continues under the current spatial feature and how urban policies, from a long-term perspective, could enhance community development.

9.1 Introduction to data, measurements and variables

A series of indicators that were established in Chapter 4 have been processed via multiple survey approaches (Table 9.1). Attracting a lot of research attention (Loukaitou-Sideris, 2006, Grohe, 2011), social stability has been suggested to have an in-depth connection with social sustainability (Landorf, 2011, Magis, 2010). Two indicators directly reflect the residential stability used in this assessment are: 'occupancy stability (OST)' and 'population stability (PST)'. Firstly, stability is related to the type of residence, as owner occupiers tend to be more stable than rental households (Randall et al., 2008). However, the classification of housing occupancy could vary in different countries and regions. Owner/self-living, rented, provided by employer, living with family are the most typical modes of current housing occupancy based on the actual housing development in Shenzhen and the common classification used by census data (CGSS, 2013b). The renting households (RH), which are also the counterpart of the 'stable household', was calculated using the data on the number of rental households gathered from the local community offices during the case study phase. Secondly, the proportion of permanent residents is another special concern for social stability in respect to the entire population of neighbourhoods. The number of rental residents could only partially represent the features of an unstable population, according to the Chinese statistical data (Beijing Statistics, 2010); in reality, the floating population not only includes the type of short-term tenant but also contains other types such as relatives of owners and visitors that temporarily stay inside neighbourhoods. Currently, these

numbers have all been counted by each local community office under the requirement of the Chinese 'hukou registration' policy. In this assessment, the indicator of population stability was calculated by the proportion of permanent residents among the entire population. The household and population data of local neighbourhoods was provided by the local community offices based on their statistics by the time of October 2013 (Appendix Tables 4.14-4.15).

Table 9.1 Stability & safety framework and indicators

Sustainability Indicator	Data collection	Initial data
9.1 Occupancy stability	Interview/Documen	Interval Scale, renting households
9.2 Population stability	Interview/Documen	Interval scale, non-permanent population
9.3 Objective safety	Interview/Documen	Interval Scale , accumulated crime records for the past years
9.4 Perceived safety	Questionnaire	Likert Scale, the ranks of satisfaction with neighbourhood safety
9.5 Property management satisfaction	Questionnaire	Likert Scale, the ranks of property management satisfaction
9.6 Community service satisfaction	Questionnaire	Likert Scale, the ranks of community service satisfaction
9.7 Property management participation	Questionnaire	Likert Scale, the ranks of engagement on property management
9.8 Committee affair participation	Questionnaire	Likert Scale, the ranks of engagement on committee affair
9.9 Residents self-governance	Questionnaire	Likert Scale, the ranks of residents self-governance
9.10Neighbourhood collaboration	Questionnaire	Likert Scale, the ranks of local collaborations

Neighbourhood safety has been highlighted in discussions worldwide and it is implied to be extremely crucial to social sustainability (Dumbaugh, 2008, Newman, 1973, Foster et al., 2013). Two indicators are adopted in this study: objective safety (OSA), based on the actual crime reports, and subjective safety (SSA), represented by the degree of perceived safety among residents. Despite having a strong psychological meaning, the perceived safety is mostly subjective and thus could vary deeply depending on demographic variables among the respondents, including factors such as age and income (Buys and Miller, 2012, Austin et al., 2002, Grohe, 2011, Foster et al., 2010). Hence, as suggested by von Wirth et al. (2015), a combination of both objective and subjective assessment is often more reliable in social research. Multiple survey methods were thus applied in this study (Table 9.1). The OSA was assessed using the documentary data provided by local police whilst the SSA was measured by the questionnaire. For the objective assessment, a tangible low crime rate is the most important manifestation for a high level of safety (Malleson et al., 2013, Newman, 1995, Abdullah et al., 2012). The original crime data for the selected neighbourhoods was annual statistics, which counts for the total criminal cases of each neighbourhood based on years' continuous records (2011 to October 2013, Appendix Table 9.16). It could also be converted

into a probability that presents the chance of the incident happening in a neighbourhood. Additionally, two datasets, 'crime record' and 'public security matter', both exist in local police stations. The latter is a wider database that includes disputes, disturbances and embroilments, which are security matters but not as serious as crimes. The first group, the accurate record of criminal cases, was regarded as more important because of the deeper influence of crime on urban safety, although the two datasets actually shared a strong linear relationship (F=32.559, p=.000). A further reason for the use of the first dataset was the lack of accessible statistics for the entire public security matters at the city level.

The assessment of neighbourhood governance, also the ultimate theme of the social sustainability appraisal in this study, was evaluated exclusively through the questionnaire. Six indicators were developed to discuss detailed features of community governance, which included the current most important contents such as stewardship of property, community service, public participation, self-governance by residents and collaborations between neighbourhoods. Because these six indicators were assessed by a sampling approach, statistical methods were again applied to verify the significance of the samples among the entire population and the robustness against the potential sampling error. Statistical analysis followed the same structure and steps as presented in the previous two chapters. Comparisons were made around the variances of the five types of neighbourhoods, which continued the discussion of urban form being a significant factor in explaining differences in community development. The correlation analysis approach was applied to examine the association between the outcome of community development and the input of planning. An upper-level comparison continued the investigation of the issues of social-spatial inequity generated under the current planning system and the potential mechanism deficiencies of community development. Eventually, the appraisal results for the different patterns of neighbourhoods were summarised for the entire layer of community development.

9.2 The community development appraisal result for the entire research area

The outcome of community development appraisal combined the results from the documentary analysis as well as results from the questionnaire survey. Although no official statistics have been issued for homeownership in Chinese cities, a special national survey suggested that downtown property ownership rates were very similar in the largest Chinese cities (Xinhuanet, 2012). For instance, the owner ratio was reported to be 70.0% for

Shenzhen, 67.9% for Shanghai and 72.8% Guangzhou, which was almost equivalent to the ratio of 65.0% found in this survey for the Houhai-Dengliang (HD) area. Additionally, only 21.18% of HD households were rental, according to the local community data in 2013. However, the occupancy stability was obviously weaker in outer districts of Shenzhen, as a local survey reported that the rental ratio for the whole city was 73.4% (S.C Media, 2014). It is a reminder that the HD area is a typical case representing downtown middle-class neighbourhoods that have been developed in Chinese large cities, which has been illustrated in Chapter 6. Furthermore, the 41.18% non-permanent population in these neighbourhoods was obviously lower than the city's level of 70.79% (Shenzhen Statistics, 2013). This was because the largest number of migrants mainly resided in the outskirts of Shenzhen instead of the inner districts. However, the population stability of Houhai-Dengliang was equivalent to the status of the district of Nanshan (39.98% non-permanent population) where Houhai-Dengliang is located (Shenzhen Statistics, 2013). It was also found to be similar to other downtown districts of Shenzhen (e.g. Futian 41.53%, Luohu 42.81%) as well as districts in other Chinese cities, such as Pudong in Shanghai (43.23%, Shanghai Statistics, 2015) and Haidian in Beijing (40.13%, Beijing Statistics, 2014). The above comparisons of occupancy and population stability again suggest that the case study is representative for many new neighbourhoods similarly developed throughout the country.

However, social stability was still insecure here, as the city is a typical migrant-dominated city in China and the unstable households and population of this area, despite being relatively lower than average, could still be considered as 'large' in terms of their absolute numbers. The result of objective safety was based on the data on criminal cases. According to the city-level police statistics (Municipal Bureau of Public Security, 2014), the annual probability of crime in 2013 was 0.085% per day per hectare across the city, which was obviously lower than the 0.58% recorded in the whole HD area. This may be due to the great spatial variation and imbalance of human activities throughout the entire large metropolitan area. However, the safety of inner Shenzhen neighbourhoods may be worse than the outer districts due to a higher-level population accumulation and thus residents could experience a higher risk of crime.

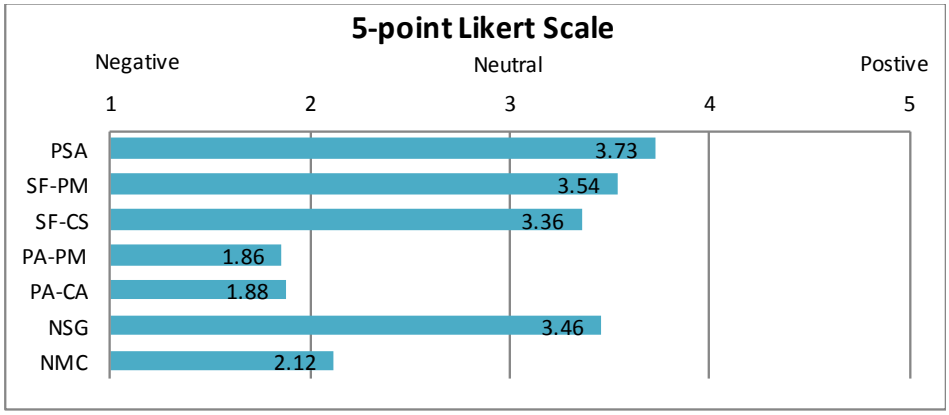

Figure 9.1 The results of 7 indicators of community development (5-point Likert scale) for the entire HD area

For the remaining indicators that were assessed by the 5-point Likert scale data in the questionnaire survey, four indicators out of seven received positive results (M>3.0, Figure 9.1). In general, perceived neighbourhood safety was decent among residents (PSA, M=3.73, SD=.984). This may not strongly support the previous finding of the objective safety, which was below the city average level and presented the existence of variations between the subjective and objective assessments on the same topic. Other conspicuous positive results were the overall satisfaction with property management (SF-PM, M=3.54, SD=1.058) and satisfaction with community service (SF-CS, M=3.36, SD=1.038). The self-governance ability was also discovered to be satisfactory (NSG, M=3.46, SD=.943). By contrast, public participation in property management (PA-PM, M=1.86, SD=1.201) and community affair (PA-CA, M=1.88, SD=1.255) were both under the neutral point (M<3.0 in this assessment). Furthermore, the last indicator, neighbourhood mutual collaboration, received an obvious low score (NMC, M=2.12, SD=1.289). To test the differences in the seven results, an ANOVA test with repeated measures was applied using a Greenhouse-Geisser correction (Appendix Table 4.18). The mean scores of these indicators were statistically significantly different (F=160.947, p=0.000) and the low scores from public participation and neighbourhood collaboration were all statistically lower than the others. The perceived safety had the highest score according to the post-hoc test (p<.05, except SF-PM). The general portrait of the case study area suggested a demographic stability after years of mature development. However, the result for objective safety was, on the contrary, not optimistic, despite most of the neighbourhoods being subjectively perceived as safe by residents. With respect to the current urban governance, the general satisfaction with both the property management and community service presented a basic achievement due to the efforts of neighbourhood management and civil service that have been made over the years. Special attention has to be paid to the public participation inside neighbourhood and the collaboration between

neighbourhoods, as both have been indicated as extremely insufficiency.

9.3 Variations in different neighbourhood patterns

9.3.1 Occupancy stability and population stability (OST, PST)

The rental household is widely indicated by studies to have weak stability (Liu et al., 2010b, Willie and Weinandy, 1963). Research has also suggested that 'marginalised and poorer residents living in disadvantaged neighbourhoods move more frequently than those in more stable neighbourhoods' (Randall et al., 2008, p.35). Figure 9.2 shows the levels of occupancy stability (OST) for the five neighbourhood patterns, which were calculated using the collected household data. The proportion of rental households was 21.95% in MSHD, 21.35% in MSMD and 29.00% in MSLD. Having the fewest unstable renting households (only 13.42% in total), LSMD appeared to be mostly stable. By contrast, the SSHD group held the highest rental ratio, which was over 60.00%. The population stability (PST) is evaluated by the two types of population, permanent and non-permanent populations. Figure 9.3 demonstrates the PST assessment results of the five patterns of neighbourhoods, in which a prominent variance could also be directly observed. In the SSHD group, the non-permanent ratio was as large as 63.85%, in great contrast to the other four types, in which the ratio was always under 50.00%. The non-permanent population was only 29.29% in MSHD and only 31.80% in MSLD, whilst this percentage rose to 39.00% in MSMD and 42.34% in LSMD.

The results of the two indicators consistently point out the unstable character of the SSHD neighbourhoods. Having a great deal of unstable households and non-permanent residents would mean these neighbourhoods experienced high social mobility, and also great uncertainty and a potential threat to their long-term sustainable development. There have been many examples in history where neighbourhoods have failed as their residents continued to move out (Shumaker and Stokols, 1982, Liu et al., 2010b), especially because of 'unhappiness with a current dwelling or neighbourhood' (Kennedy, 1984, p.4). Recently in China, a more equal and balanced urban development promoting the mixture of social classes and providing fair resources has been suggested by researchers (Chen et al., 2010). However, the phenomenon of population flow in and out of neighbourhoods could also be related to external social-economic factors. For example, the affordability of housing/renting price would greatly determine the actual residential choice of migrants. However, considering the large number of urban immigrants at the present time, policies for urban planning, public security and community governance for Shenzhen, need to pay

special attention to this stability issue. Targeted policies in certain neighbourhoods to promote social stability could still be important, as in general the increase of floating population is a great challenge to community social sustainability (Mowbray et al., 2007, Wiesel, 2014).

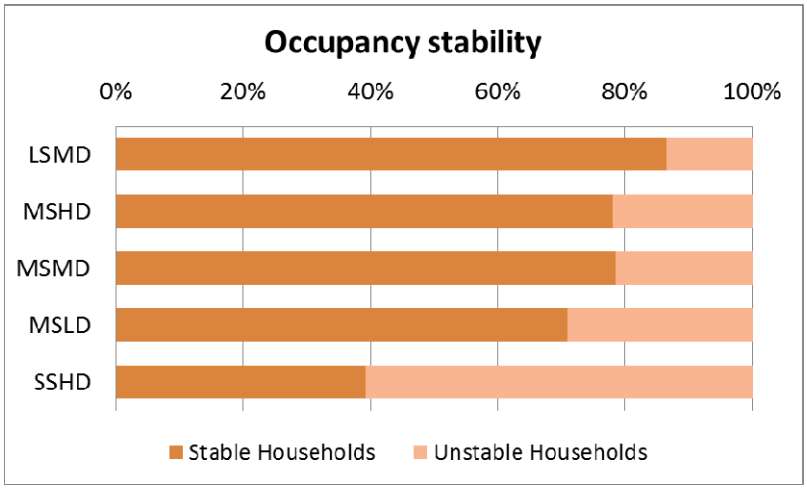

Figure 9.2 The result of neighbourhood occupancy stability by the five forms

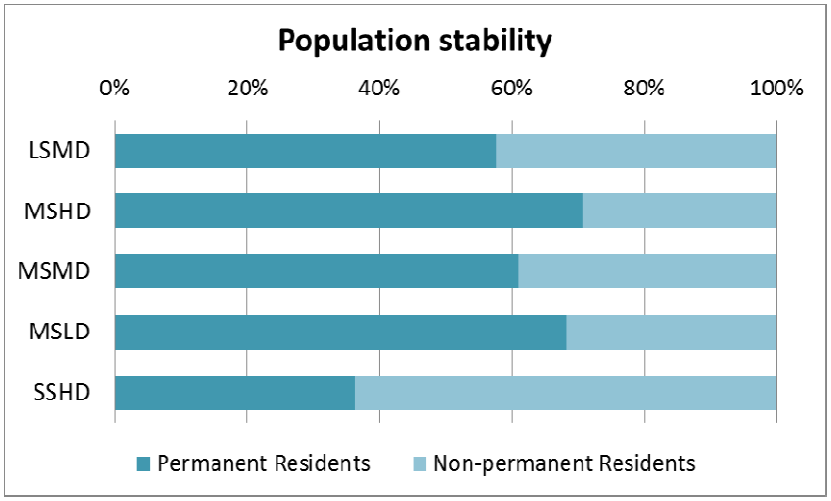

Figure 9.3 The result of neighbourhood population stability by the five forms

9.3.2 The objective safety and perceived safety (OSA, PSA)

The objective safety assessment used the datasets provided by local police. Both datasets of criminal cases and security matters, as introduced previously in section 9.1, were discovered to have a strong positive linear relationship with neighbourhood household numbers (Figure 9.4, 9.5). However, a simple conclusion that large neighbourhoods appeared to have a lower safety level than small neighbourhoods would be unfair and improper, as the quality and features of neighbourhood spaces possibly play a role in reducing crime, according to Newman (1995) and Foster et al. (2010). In this assessment, the original data on the accumulated number of criminal cases was firstly converted into the 'spatial crime rate'

presenting the unsafe level for each place based on a standardised calculation (crime per hectare) , by which the group differences can be initially compared. For example, from 2011 to 2013, the rate was only 5.36 per ha in MSLD but was as high as 38.70 per ha in SSHD. Considering the time factor, the real probability of crime happening (PCH) in neighbourhoods was calculated as the number of crimes per day per hectare. The outcome of PCH is shown in Figure 9.6, which indeed presents the real unsafe level for neighbourhoods. This level was noticeably high in SSHD (3.76% per day per hectare), indicating that this area was less safe compared with the others. MSLD and MSHD together shared the lowest probability (0.52% per day per hectare). The results indicate that there would be issues regarding safety in the type of small-scale, high-density neighbourhoods. From both the local police records and neighbourhood interviews, the researcher finds a related large number of theft reports in these neighbourhoods. However, to represent the objective safety (OSA), the actual safety is, in reverse, calculated by the formula OSA= 1-PCH. The ultimate objective safety level of the five types of neighbourhood is shown in Appendix Table 4.16, after a complex mathematical operation. The safety level of the SSHD neighbourhood in reality is discovered to be consistently lower than other types of neighbourhood.

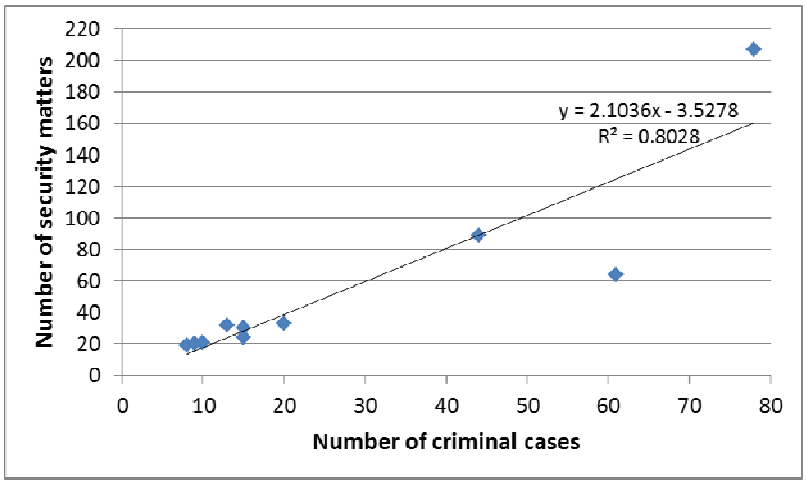

Figure 9.4 Regression model I: the strong association between neighbourhood criminal cases and security matters

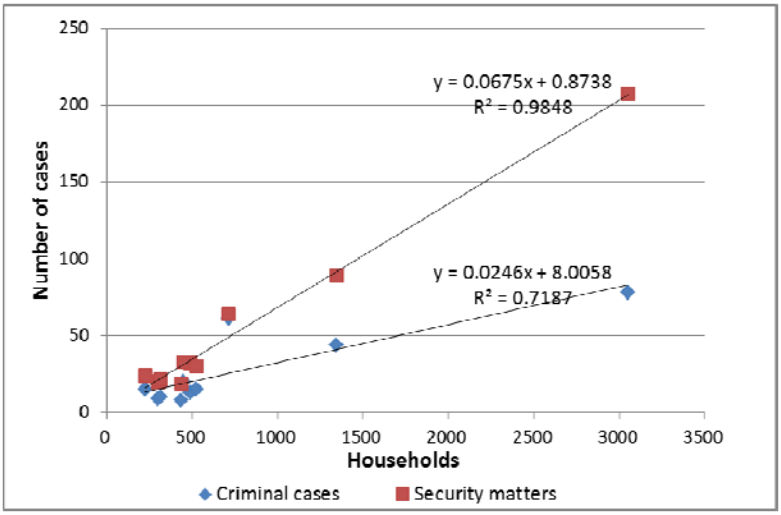

Figure 9.5 Regression model II and III: the linear relationship between criminal cases and households and the linear relationship between security matters and households

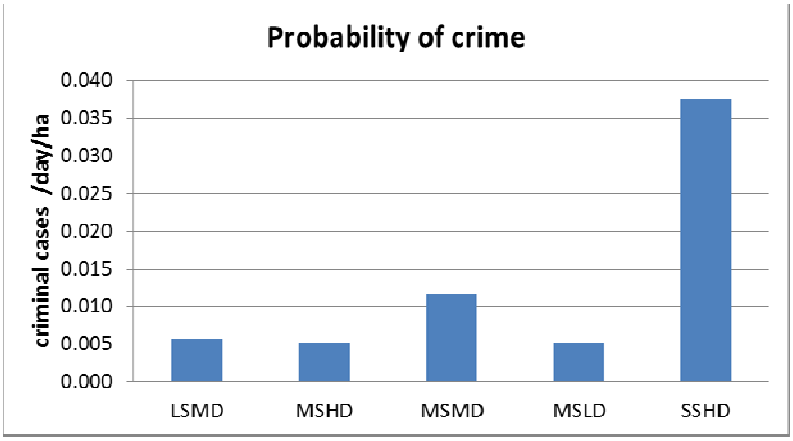

Figure 9.6 The spatial crime probability by the five forms

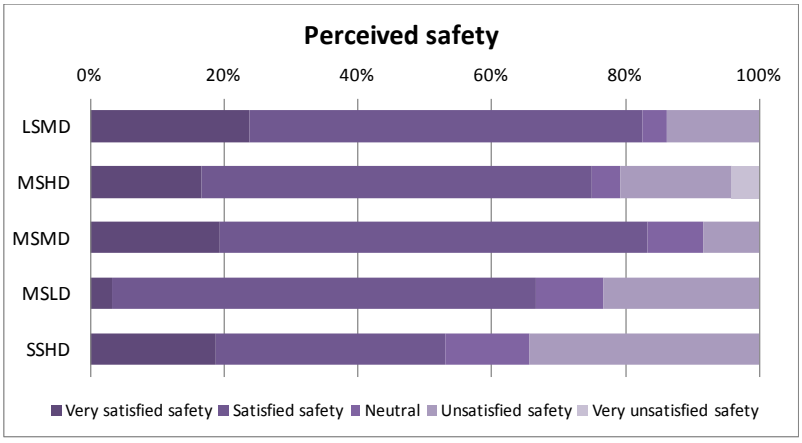

Figure 9.7 The perceived neighbourhood safety by the five forms

The perceived safety (PSA) was determined via a subjective self-assessment section in the questionnaire. Positive perceptions (including both satisfied safety and very satisfied safety answers, see Figure 9.7) were largely reported by participants in the neighbourhoods of

MSMD (83.33%) and LSMD (82.50%). The positive ratio was 75.00% in MSHD and 66.67% in MSLD, but dropped to only 53.13% in the SSHD group. A significant difference (Welch F (4, 90.069) =2.849, p=0.028) was found using the enhanced ANOVA test (Appendix Table 4.19). Multiple comparisons by the post hoc (Games-Howell) test, however, surprisingly did not find any significant difference between these groups (Appendix Table 4.20). This was perhaps because the overall ANOVA test calculated the group differences among the entire participants, N=226, but the multiple paired comparisons, here the Games-Howell post-hoc test, only compared the results between each type of neighbourhood (N is between 30 and 82). Thus, the p value would be adjusted in each post-hoc test. The comparison results would also yield as insignificant due to the limited sample sizes in some groups, and these mismatched results occasionally occur in social studies (Homack, 2001). For perceived safety, relatively higher scores appeared in MSMD (M=3.94, SD=.791) and LSMD (M=3.93, SD=.911). Evidence indicated the differences between each cluster are not statistically significant, although the SSHD received a low result (M=3.38, SD=1.157). This indicates that the subjectively perceived level of safety seems to be equivalent among different neighbourhoods, in great contrast to the obvious gap found in the objective safety assessment. This is on one hand due to the limitation of the sampling approach itself, as the mean scores of the OSA could have biases due to unpredictable sampling errors. On the other hand, another possible reason is that residents may not be fully aware of some previous incidents since they usually have no access to the census data of criminal reports.

9.3.3 The satisfaction with property management and community service (SF-PM, SF-CS)

In China, the bottom-scale urban neighbourhood governance includes property management and community service, which are operated by different stakeholders (Tang, 2015). For the stewardship of property, professional agencies are usually hired by residents to manage inner surroundings and facilities. Five different types of neighbourhood have all received positive results (Figure 9.8) in the assessment of satisfaction with property management (SF-PM). The highest satisfactory rate was from LSMD, with 80.00% participants either satisfied or very satisfied; meanwhile, a relatively lower ratio of 60.00% was recorded from MSLD. Statistically, a significant difference was found by the enhanced ANOVA test (Welch F (4, 86.232) =2.546, p=.044). However, similarly to the previous discussion, the post hoc test could not directly provide evidence of any group differences, and the variations between each pair were eventually regarded as non-significant. It is common for property management teams to provide services for gated neighbourhoods in

China. Their responsibility is to manage the neighbourhood public places and facilities, mainly through a service contract providing cleaning, security, maintenance and other sorts of services. In the case study interviews, most of the neighbourhoods were found to have professional property management teams with a certificate for providing qualified services. Moreover, the positive outcome can also be linked to the maturity of the housing market in Shenzhen and the legalised regulation on property management since the end of the last century (Shenzhen, 1998).

Resident-based community service (CS) is usually provided by a community station led by the upper-level street office, which is also under the supervision of the department of civil affairs in the local authority. The service widely includes hukou and population registration, birth control and family planning, civil consultation and so on; there have been increasing items that included in the community service recently (Xiang, 2012). However, nearby neighbourhoods may have to share and coordinate, as the service is not exclusive to any specific one. The outcome of the community service satisfaction is shown in Figure 9.9. The dissatisfaction rate was found to be relatively low in the LSMD (15.00%) and MSMD (13.89%); however, it increased to 31.25% and 33.33% in MSHD and MSLD, respectively, and further reached 50.00% in SSHD. When analysing the Likert-scale data by the enhanced ANOVA test, the general variance in statistics was revealed to be very significant (Welch $F(4,89.250)=7.852$, $p=.000$). The post hoc test (Games-Howell) indicated that there were striking mean differences between the LSMD ($M=3.79$, $SD=.882$) and three of the other groups, SSHD ($M=2.78$, $SD=1.184$), MSLD ($M=3.03$, $SD=.890$) and MSHD ($M=3.15$, $SD=1.111$). Thus, residents in LSMD neighbourhoods are more likely to be more satisfied with the received community service. Within different community service boundaries, the neighbourhoods LSMD-1 and LSMD-2 have both shown considerably high levels of satisfaction with their corresponding services from community station CS1. This may be firstly because of their stronger relationships, which are shaped by the relatively large populations. At the moment, the public service provided by local community offices is a network-based arrangement, which has been divided into small units according to the neighbourhood population and scale. The service input and number of volunteers are also determined by this arrangement. Thus, for these large neighbourhoods, it is understandable that their more frequent contact with community centres and the greater benefits they receive from their service have resulted in a higher level of satisfaction. Secondly, the high level of satisfaction coincides with their geographic locations, as both are nearer to

community centres (see Figure 7.3 in Chapter 7), so it is relatively convenient for their residents to walk in and seek assistance.

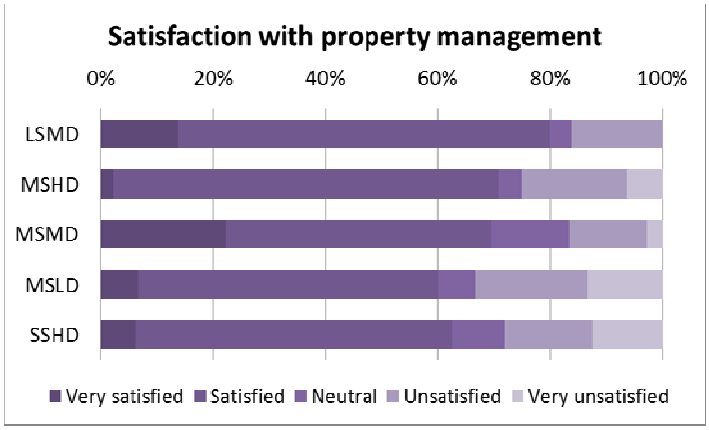

Figure 9.8 The satisfaction with property management by the five forms

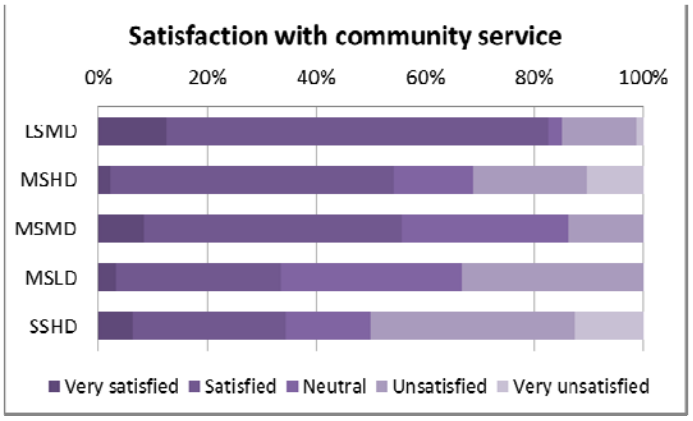

Figure 9.9 The satisfaction with community service by the five forms

9.3.4 Participation in property management and committee affairs (PA-PM, PA-CA)

As an important catalyst for social development (Warburton, 2013), public participation in urban planning and urban governance is now embracing a gradual growth in China. In the bottom neighbourhood, residents make their voices heard mostly through two channels: participation in property management (PA-PM) and participation in committee affairs (PA-CA). The first type of engagement encompasses the provision of advice and assistance to the managing agencies regarding physical issues of concern in the neighbourhood. The second type of involvement is a bottom-up democracy process electing a self-organised committee that speaks on behalf of residents. Both processes are now under a legal framework established by the state in 2007 (P.R.China, 2007a, P.R.China, 2007b). In this appraisal, negative participation in the property management (including rare and very rare participations) appeared to be common, as it reached 78.75% in LSMD, 75.00% in MSHD, 69.44% in MSMD, 86.67% in MSLD and 87.50% in SSHD (Figure 9.10). A similar outcome

could be observed in the assessment of the participation in committee affairs (Figure 9.11). The proportion of negative answers was also generally large among all the groups, which was in the range of 67.50% (LSMD) and 86.67% (MSLD). The ANOVA tests further indicated that no significant group difference was found in PA-PM (Welch F(4,93.976)=1.917,p=.114) or PA-CA (Welch F(4,94.398)=1.903,p=.116). According to the two assessments of this study, the lack of public involvement in these neighbourhoods is evidently common at present.

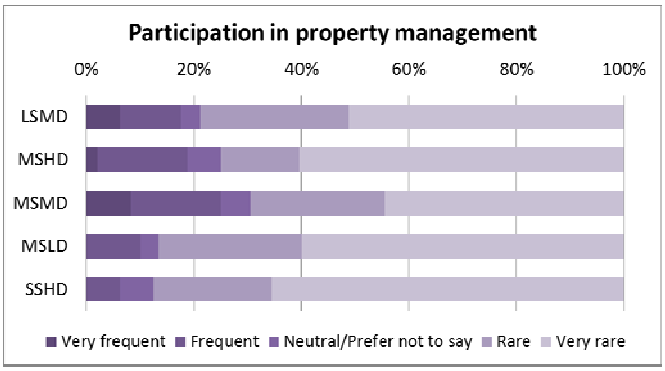

Figure 9.10 The participation in property management by the five forms

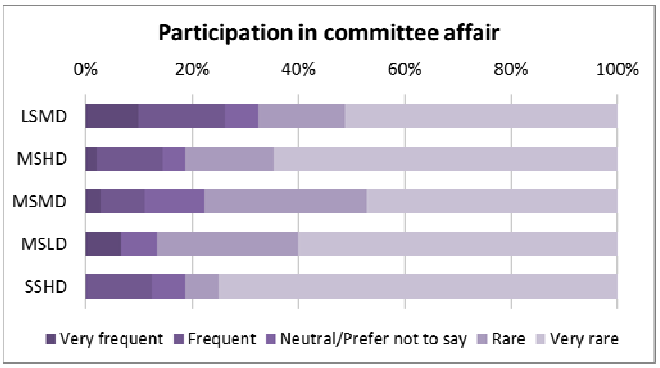

Figure 9.11 The participation in committee affair by the five forms

The above results present the current insufficiency of public participation in Chinese neighbourhood governance. In the interviews with many residents, most of them treated their relationship with the property management team only as a kind of paid service. Unsurprisingly, specific academic attention has not been paid to this area until recently. Although the real relationship between agencies and residents is similar to that of employee and employer, residents often lose the supposed 'dominant position' in reality, as indicated by Wu and Jiang (2015). The illegal actions infringing property rights that have greatly emerged could be triggered by different actions (Wu, 2013); for example, the indifference of the managing teams which allow illegal constructions inside neighbourhoods, or the inaction of them on behalf of developers regarding necessary maintenance requests from residents. The recent increase in individual property ownership appears, however, on the other hand, also inspires the potential interest of residents to largely participate in

property management. As a matter of fact, the importance of participation has a strong parallel with the long-term social development for protection of social rights as well.

The neighbourhood committee, also called the 'homeowners' association' (Shieh and Friedmann, 2008), is the most typical current internal institution founded by residents themselves, through which particular needs and requirements can be proposed to upper-level of governance on behalf of a neighbourhood. Surprisingly, residents' engagement with the committee is found to be weak in this case study. Shieh and Friedmann (2008) suggest that the participation in the committee in China is meaningful; however, their effectiveness seems to be weak among urban residents unless or until their living environment has been directly affected. This seems to be true but there could be more explanations for this low-participation result. Firstly, neighbourhood as it is discussed today in China is shaped during a transitional period where the old work-unit-based social structure has been decomposed and people who do not know each other are geographically connected by the privatised housing market (Xu and Chan, 2011). Secondly, the current governance system has not clearly explained the roles played by different stakeholders, and the boundaries of social capital and governmental leadership are ambiguous (Xu, 2008). To solve the current low levels of participation, residents should be motivated to act independently and collectively (Zhu, 2015, Tomba, 2005). This leads to a discussion of another important issue: the availability of self-governance considering the rapid growth trend of social capital inside urban neighbourhoods.

9.3.5 Neighbourhood self-governance (NSG) and mutual collaboration (NMC)

The indicators of neighbourhood self-governance (NSG) and mutual collaboration (NMC) are linked to long-term community development. Two different scenarios occur in the two assessments. Numerous participants had no doubt about their ability to self-govern (Figure 9.12), which was obviously positive in LSMD (65.00%), MSHD (66.67%) and MSMD (63.89%). The ANOVA test was implemented to understand the general statistical variation among these groups, and a significant variance was found ($p=0.045$, Appendix Table 4.19). Multiple comparisons between individual forms were examined by post hoc test (Tukey HSD), which explained that the major difference was due to a significant gap ($p<.05$, Appendix Table 4.21) between the bottom, SSHD, ($M=3.00$, $SD=1.016$) and the top, MSMD, ($M=3.64$, $SD=.867$). By contrast, in terms of local neighbourhood collaboration, this was noticeably low level among all five groups (Figure 9.13). Lack of cooperation seemed to be common among most

residents, as it reached 58.33% in MSHD, 68.75% in LSMD, 63.89% in MSMD, 70.00% in MSLD and 81.25% in SSHD. The ANOVA test suggested the group difference was statistically non-significant (Welch F(4,93.528)=2.400, p=.055). As a result, currently there seems to be a general lack of mutual neighbourhood collaboration in the entire case study area. The above result implies that residents in different types of neighbourhood have all expressed their confidence in governing the neighbourhoods by themselves via a self-disciplined approach. A relevant low level of self-governance for SSHD, however, might be a potential obstacle for future development.

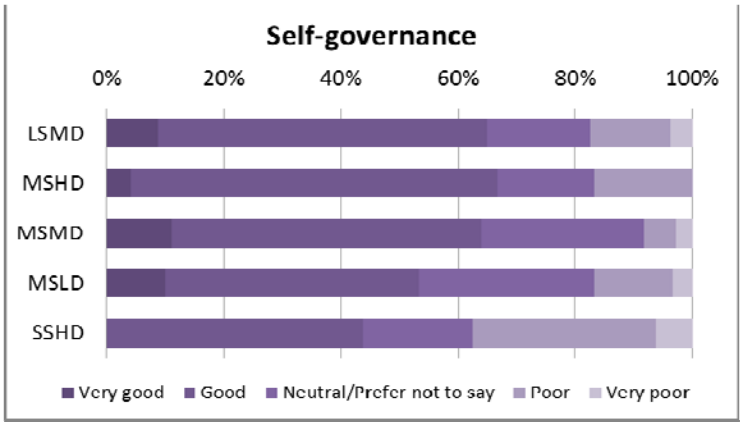

Figure 9.12 The result of neighbourhood self-governance by the five forms

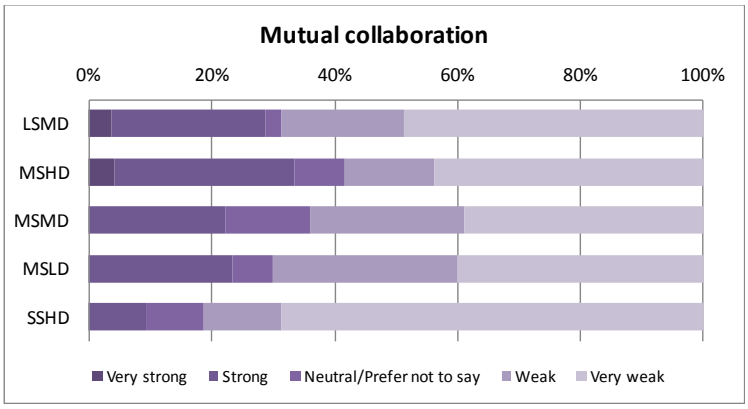

Figure 9.13 The result of neighbourhood mutual collaboration by the five forms

Without the abilities of self-governance and mutual collaboration, urban neighbourhoods in China are only spatial items, not qualified to be described as what this study emphasises as a 'community' concept, in which a strong sociological character is fundamental. There are several implications from the above outcomes. Firstly, as the self-governance ability has been discovered to be favoured by the residents in many cases, a positive empowerment in urban governance with self-growing resilience, indicated as a substantial role for social sustainable community (Yuting, 2013), can be released. The current Chinese community institution is occurring amidst a period of transition, as discussed in Chapter 2, which uses a

geographic zoning and territory bounded development mode. The two institutional modes – official leadership and self-organisation – have been both attempted in the past decades. Strong top-down intervention is suggested as crucial (Zhao, 2015) because self-governance in Chinese neighbourhoods seems to be immature (Xu, 2001). However, the experiment with a new governance mode by establishing residents' self-organisation is still emerging quickly (Zhou, 2014). The outcome of this study indicates that the latter self-governance mode becomes feasible in Shenzhen. This would be a solution for the headache of work overload in some community services, and act as a rebalance between the socialised governance and the traditional governmental management (Zhang and Yan, 2014). Secondly, the result of mutual collaboration reminds us that the bottom-scale cooperative planning is inadequate at the present. This has been confirmed in this case study area and could be similar in most places in Shenzhen considering the same institutional organisation and social development background. The lack of collaboration is firstly because of the upper-level administrative system. As suggested by Ying (2004b) and Zhang (2011), there are some cross-institutional issues for the sub-organisation of local authorities in terms of the conflicting boundaries in planning and governance, as discussed in Chapter 3, the dual systems. Furthermore, the gated neighbourhoods and their privatised boundaries are also great barriers to promoting mutual cooperation. Social inequality and spatial segregation are suggested to have an acute impact on achieving sustainable social development and what is widely referred to in China as 'harmonious society' (Xu, 2001). Thus, a planning intervention is still necessary and should be targeted specifically at solving the current urban fragmentation. However, academic voice and policy-action are both rare at the present. On the other hand, for improving social inequality, a more synthesised institutional adjustment is indispensable in future neighbourhood governance.

9.3.6 The overall appraisal results and social sustainability indices

The application of multiple indicators and dimensions could carefully decrease the potential bias or prejudice generated by a single indicator. The overall appraisal result of the layer 'community development' was converted by the Z-score method, which synthesised all the indicators of neighbourhood stability and governance and combined the data in different types and ranges (Table 9.2). From these detailed comparisons, neighbourhoods in the types of LSMD and MSMD can be clearly recommended due to the high levels of overall community development (M=0.734, 0.627). Although the LSMD has a leading position in general, the MSMD has received almost equal levels of sustainability in many aspects, and, it even has higher participation in property management and higher self-governance ability

than LSMD. The MSHD is ranked third, but also has a positive result in general (M=0.242). The social stability of this pattern appears to be fine, but its governance would be relatively weaker than the above two patterns. The remaining two types, MSLD and SSHD, which have both received negative scores ultimately (M=-0.227, M=-1.376), are judged to be unsustainable forms. Especially due to an extremely low score, the pattern SSHD is utterly unsustainable. Especially, the SSHD neighbourhoods seem to be have a great social instability and the governance and redevelopment of these neighbourhoods would be under great uncertainties and challenges. Clearly displaying their advantages and disadvantages, the spider chart (Figure 9.14) again visibly indicates the apparent variances in the five patterns of neighbourhoods.

Table 9.2 Social sustainability index III: Z-score results for the layer of 'Community Development'

Form	OST	PST	OSA	PSA	SF-PM	SF-CS	PA-PM	PA-CA	NSG	NMC	Overall
LSMD	0.861	-0.079	0.508	0.963	1.145	1.357	0.413	1.559	0.389	0.226	**0.734**
MSHD	0.398	0.874	0.579	-0.033	-0.240	-0.261	0.092	-0.385	0.457	0.934	**0.242**
MSMD	0.431	0.165	0.085	1.037	0.940	0.631	1.393	0.369	0.845	0.378	**0.627**
MSLD	0.017	0.691	0.579	-0.806	-1.079	-0.546	-0.754	-0.555	0.021	0.167	**-0.227**
SSHD	-1.707	-1.651	-1.751	-1.161	-0.766	-1.181	-1.145	-0.988	-1.711	-1.705	**-1.376**

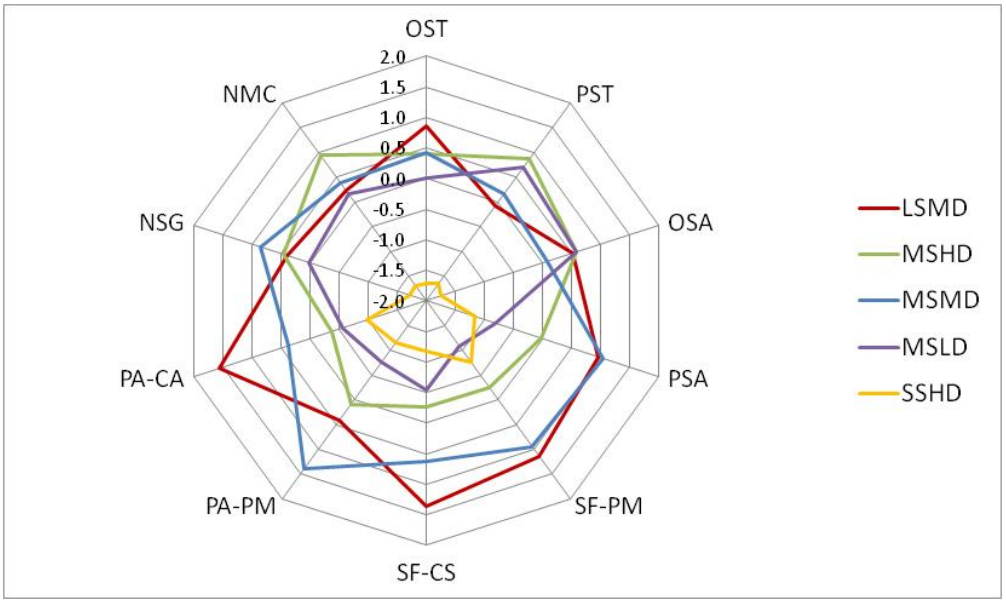

Figure 9.14 Sustainability Index: Community Development of the Five Patterns of Neighbourhoods

9.4 Reflections on the current planning system

9.4.1 Understanding the impacts of urban form

From an analysis of emerging theoretical and policy literature, Muggah (2014, p.345)

concluded that 'urban fragility is neither inevitable nor irreversible. It is the very resilience of cities, their neighbourhoods and institutions that are often overlooked in efforts to promote stability and development'. Consistent with the previous discussions, the spatial-social imbalance issue continues at the level of urban block in this research area. Two urban blocks (see Figure 6.10 in Chapter 6) in the case study area were almost equal in terms of the size (plot area) and population (households), but a prominent spatial difference exists. The obviously fragmented pattern of Block 2, which is in great contrast with Block 1, a more integrated form. A variation of social sustainability simultaneously occurs with this spatial divergence (Table 9.3), including the differences in neighbourhood stability and safety. The renting households in Block 2 reached 27.51% in total, which was much larger than the 15.11% in Block 1. The proportion of non-permanent population in Block 2 was 43.95%, which was also greater than the 38.50% recorded in Block 1. Despite the similar levels of perceived safety among residents (M1=3.663, SD=1.0509; M2=3.776, SD=.945, p=.404), there was still a clear variation between the two blocks in the aspect of recorded urban safety. In the past few years, the accumulated number of crimes in Block 2 was 172 in total, and this was much higher than the recorded 101 in Block 1; the possibility of crime in Block 2 was almost double compared with Block 1 (0.99% vs 0.52%, per day per hectare). Thus, in this assessment, the overall stability of Block 1 was much better than Block 2. This evidence indicates that social stability can be affected by the control of the urban form, not only at the bottom neighbourhood level but also at the larger scale of urban block, the major controlling level of the current planning system. A fragmented pattern, in general, could be less socially sustainable than a united pattern. This suggests that the local planning system needs to reconsider the proper united model of neighbourhood pattern and the corresponding approaches of regulating urban land and the scale of development.

Table 9.3 Comparisons of urban stability at the urban block level

Block Code	Plot Area	Households	Number of neighbourhoods	Percentage of Renting households	Non-permanent population	Possibility of crime
Block 1	18.729 ha	4010 hh	3	15.11%.	38.50%	0.52%
Block 2	16.823 ha	3842 hh	7	27.51%	43.95%	0.99%

Another significant difference lies in the service provided by community stations (CS), the boundaries of which, however, are slightly different to the boundaries of urban blocks in this area (see Figure 6.10 in Chapter 6). The satisfaction regarding the service provided by community station CS1 (M1=3.692, SD=.9030), which consists of two LSMD neighbourhoods

and one MSMD neighbourhood, is discovered to be obviously higher (p=.000, Appendix Table 4.22) than for community station CS2 (M2=3.141, SD=1.0662), which is fragmented into a vast mixture of neighbourhoods in many types (SSHD, MSLD and MSHD). This indicates that a more integrated pattern may also present a higher level of satisfaction with the community service. For other indicators, such as property management and neighbourhood self-governance, comparisons at the urban block level seem to be meaningless considering the different stakeholders and neighbourhood ownerships. In summary, from a higher-level consideration (including both the urban block and community service perspectives), the united urban form should be encouraged as it evidently generates enhanced social stability and improved social satisfaction with public services.

The nexus between urban form and community development outcome was further analysed. Different roles of urban form variables were also revealed by Pearson correlation analysis at the neighbourhood level, where the discussion of neighbourhood form was meaningful. **Site scale** was revealed to have a coherently positive effect on all 10 indicators, and was especially significant in the assessments of neighbourhood governance regarding the satisfaction with community service (R=.784, p=.007) and participation in community affairs (R=.664, p=.036). By contrast, the variable **FAR** was found to have a constant negative impact on neighbourhood stability, which was typically significant in three indicators, occupancy stability (R=-.795, p=.006), population stability (R=-.722, p=.018) and objective safety (R=-.848, p=.002). Furthermore, in neighbourhood governance, self-governance ability was also be obviously reduced with the increase of FAR (R=-.660, p=.038). As a coefficient variable, **population density** also had an extremely similar effect to FAR (see Table 9.4). Interestingly, variable **building coverage ratio** (BCR) was also found to have a consistently negative role in the assessment. Besides the correlations with three similar stability indicators, occupancy stability (R=-.887, p=.001), population stability (R=-.639, p=.047) and objective safety (R=-.912, p=.000), it was also associated with the community service satisfaction (R=-.712, p=.021). These relationships represented by form variables can provide extra explanations in the above comparison of the five different patterns. The stage of determining urban form variables appears to have an impact on the future conditions of these neighbourhoods in terms of community development; what we now understood is that, above that, the LSMD and MSMD are superior whilst the SSHD would be mostly unsustainable.

The negative effects of density should be noticed. Controversially, the high-density model is often emphasised by academic research and planning policies (Leccese and McCormick, 2000, Gordon and Vipond, 2005) as beneficial to a sustainable community. However, this research provides evidence that the high-density type may pose a potential threat to neighbourhoods in China. Firstly, there is a noticeable decreasing trend in stability and safety with the increase of FAR. Secondly, the evidence further indicates that neighbourhood governance could be influenced by density, which makes the management of such neighbourhoods difficult. In contrast to the previous high-density advocators, this study detects that the intensification of physical conditions, in fact, may not be effective in respect of promoting social sustainability. For instance, some physical interventions, such as increasing the coverage of cameras, have been indicated as critical (Ibrahim, 2011, Mehta, 2014). However, in this study, both the objective and perceived level of neighbourhood safety were found not to be associated with camera surveillance facilities (Appendix Table 4.23). Usually, a high-density area is supposed to have strengthened facilities due to a relatively compact environment (Edward, 2010), and in this case study, the intensity of camera surveillance was also higher in SSHD than in the other areas. However, as disclosed in section 9.3.2, there was still a higher possibility of incidence and crime in these high-density neighbourhoods. This further indicates that the intensification of these controls is more likely to be a placebo, which is in accord with Gill et al. (2007), who suggested that, to improve residents' safety, reducing the victimisation experience is much more important than the introduction of CCTV. Consequently, for improving community development, 'soft' social factors can be even more essential than 'hard' physical factors.

Table 9.4 Person's correlations: urban form variables and community development indicators

Urban Form variables	9.1 OST	9.2 PST	9.3 OSA	9.4 PSA	9.5 SF_PM	9.6 SF_CS	9.7 PA_PM	9.8 PA_CA	9.9 NSG	9.10 NMC
Site scale	0.598	0.144	0.394	0.339	0.532	.784**	0.297	.664*	0.423	0.053
Sig. (2-tailed)	0.068	0.692	0.26	0.339	0.113	0.007	0.404	0.036	0.223	0.885
FAR	-.795**	-.722*	-.848**	-0.355	-0.303	-0.494	-0.514	-0.414	-.660*	-0.51
Sig. (2-tailed)	0.006	0.018	0.002	0.314	0.395	0.147	0.128	0.234	0.038	0.132
BCR	-.887**	-.639*	-.912**	-0.311	-0.362	-.712*	-0.419	-0.51	-0.602	-0.322
Sig. (2-tailed)	0.001	0.047	0.000	0.381	0.303	0.021	0.228	0.132	0.066	0.364
D_P	-.896**	-.858**	-.936**	-0.467	-0.393	-0.561	-0.539	-0.411	-.765**	-0.61
Sig. (2-tailed)	0.000	0.002	0.000	0.174	0.261	0.092	0.108	0.238	0.01	0.061

N=10** Correlation is significant at the 0.01 level (2-tailed).* Correlation is significant at the 0.05 level (2-tailed).

9.4.2 Thorough interventions for community development towards social sustainability

The above discussion further reflects the fact that urban stability is not only shaped by the physical environment but also by the social relationship and neighbourhood governance. This would be a possible explanation for why some old neighbourhoods in Chinese cities have had reasonable safety levels and have been able to survive till now (Lu, 2005). Although their physical input of facilities are limited, the close social ties and active participation have played significant roles (Li, 2014). For those neighbourhoods, residents' collaboration would be helpful to decrease and prevent crimes. Hence, the community development should not only rely on the technical improvement of the physical environment; the cultivation of social attributes should also never be forgotten. Although the planning process should limit the use of unsustainable patterns of urban forms, the planning system should clearly be able to do more than that. The low level of public participation and collaboration cannot be ignored. The related indicators of PA-PM, PA-CA and NMC evidently show that the public involvement in the bottom neighbourhood scale is weak and a collaborative system has not been established, despite some recent increasing trends (Qian and Niu, 2007, Zhao and Zhao, 2003).

Further analyses were carried out to test the impacts of demographic factors (Table 9.5). The community development indicators are not found to be associated with the respondents' education background and age. Income is found to be weakly correlated with two indicators, participation in property management and participation in committee affairs. This indicates that the wealthy population may have a potential for being more willing to become involved in neighbourhood affairs and propose for the development of their neighbourhoods. Household member has a weak negatively association with the same two indicators of public participation, PA-PM and PA-CS. This suggests that people in a large family (or with many flatmates) may be less interested in participating. Another social-demographic factor, the length of residence, is found to be weakly correlated with the overall perception of safety. The increased awareness about the lack of safety is perhaps because residents who have lived in an area for longer are more familiar with previous incidents than are the new inhabitants. However in generally, the weak connection between population demographic and community development suggests that the variation of demographic features does not strongly impact the development of neighbourhood social sustainability in reality.

Table 9.5 Spearman's correlations: social-demographic variables & community development indicators

		PSA	SF_PM	SF_CS	PA_PM	PA_CA	NSG	NMC
Age	Coefficient	-0.062	-0.079	-0.116	-0.065	-0.059	0.044	0.032
	Sig. (2-tailed)	0.351	0.238	0.082	0.333	0.377	0.510	0.634
Household Member	Coefficient	-0.001	-0.009	0.078	-.194**	-.144*	-0.062	0.040
	Sig. (2-tailed)	0.987	0.890	0.240	0.003	0.030	0.353	0.551
Length of Residence	Coefficient	-.145*	-0.103	-0.13	-0.049	0.016	0.058	-0.018
	Sig. (2-tailed)	0.032	0.128	0.054	0.47	0.819	0.392	0.789
Education background	Coefficient	-0.002	-0.024	0.017	0.008	0.024	-0.051	-0.014
	Sig. (2-tailed)	0.973	0.717	0.798	0.900	0.716	0.442	0.837
Income	Coefficient	-0.016	-0.027	0.037	.152*	.168*	0.059	-0.014
	Sig. (2-tailed)	0.807	0.681	0.584	0.022	0.011	0.38	0.832

N=226, except N=220 for length of residence; ** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

More importantly, the development of community social sustainability has a united framework in that improving social factors could have cascade effects or chain reactions. For instance, the level of social stability is related to the level of neighbourhood governance, as the correlation analyses suggest that the individual perception of safety is significantly related to the satisfaction with stewardship, both with the property management (R=.566, p=.000, N=226) and community service (R=.438, p=.000, N=226). Hence, improvement to the stewardship quality could mainly be operated by a resident-led social intervention, and could also be effective in improving the perception of neighbourhood safety. Unsurprisingly, the level of mutual collaboration between neighbourhoods is also associated with the level of public participation, both in property management (R=.217, p=.001, N=226) and committee affairs (R=.141, p=.034, N=226). The enhancement of upper-scale cooperation with nearby neighbourhoods could also bring benefits to the participation inside neighbourhoods. Moreover and more importantly, none of these approaches necessarily require physical planning intervention as a matter of course. Wu (2002) asserts that the rebuilding of urban communities is a top priority for local Chinese governments. As a result, the urban governance policies, which have become even more crucial than planning & design after twenty years' rapid urbanisation in China, should pay more attention to underpinning social capital and self-governance at the bottom neighbourhood scale. This has a consistency with the findings in Chapter 8 that physical planning has only a limited influence on promoting the development of neighbourhood social networks.

With the deceleration of massive urban construction, the Chinese planning system has been challenged by new approaches for managing space and making place. As Wates and Knevitt

(1987, p.97) suggested, 'neighbourhoods which really last and gave most satisfaction to people who live and work in them, are those which the residents themselves have helped to shape and manage', neighbourhood governance in China has become more crucial than even. Dempsey et al. (2011) and Berkeley (2012) also suggested the final approach of a mature community should be from a strong ability for self-growth in the long term. Adjustment in the current planning system, as many studies have emphasised (Jin and Zhu, 2011, Lu, 1999, Ying, 2004a), is necessary. The top-down planning system which used to pay great attention to land use and economic development now has to include the social perspective, ultimately. As the influence of physical input has been discovered to be limited in a certain extent, a socially sustainable system itself would be an important future scope as well. This is firstly because the current neighbourhood planning system is immature. As to what the facts of insufficient public engagement and weak local collaboration represent, the current planning system has not yet given enough attention to the collaborative approach at the bottom scale. However, as an essential instrument that reflects the aspirations and achieves the demands of the residents (Friedmann and Chen, 2009a), the implementing of neighbourhood planning with a bottom-up perspective is necessary. Some research has suggested that overloaded community offices' work could be replaced or handled through the approach of self-governance with involvement of residents' committees (Qian and Shenjing, 2012). However, as discussed in Chapter 3, the stakeholders' coordination mechanism which involves community officers, residents' committee and property management teams is far from synchronised. Secondly, the solo top-down planning perspective would be inappropriate, and may, in fact, obstruct the bottom-level neighbourhood development due to its many restrictions. The current guidance for planning and development in Shenzhen is criticised as containing rigid and technical-led standards with a lack of consideration of long-term, resilient management (Xu et al., 2013). Furthermore, inside the planning system, the bottom-level realities and voices of neighbourhoods have rarely been reflected throughout the planning decision-making process.

Finally, facilitating community deliberation is suggested to be important (Tang, 2015), in which the current powerful leadership of the government (including the party) and the existence of resident representative organisations are the two key points. The latter might even be able to develop collective reasoning strategies to help empower residents' claims and requests. However, at the city level, different types of urban neighbourhoods may still

need to be classified and treated distinctively in terms of organisation and governance. More essentially, for mutual collaboration, cross-boundary cooperation is important. However, at the present it is especially difficult under the split urban form. As indicated by certain scholars (Keen et al., 2006), a really big challenge for sustainability is to devise systems that are vertically (across organisational hierarchies) and horizontally (across organisational units) integrated. The fragmented urban neighbourhoods thus should be united in many places in Shenzhen. An integrated community could be taken as a united stakeholder, which should play an active role in the planning process due to the high aspirations of the community. Especially, it should be empowered and encouraged to prepare its community plan, respecting the real development demands. Generally speaking, community-level deliberation is essential for China and Shenzhen, as it finally shapes the sustainability of communities to have their own strong power and resilience, in which socially sustainable growth could be incubated.

9.5 Conclusion

In this chapter, the appraisals of community stability and governance have portrayed numerous findings. The forms of LSMD and MSMD are clearly recommended from the evidence of social stability and neighbourhood governance. In contrast, the SSHD represents a poor level of social sustainability by its consistently negative results. Although the urban form's influence is still tangible, evidence also shows obvious gaps in public participation and neighbourhood mutual collaboration, which may be further beyond the traditional concern of the Chinese planning system. What is indeed insufficient at the bottom scale is, however, an advanced collaborative working system to facilitate future community development. A systematic adjustment in a more cooperative manner seems to be far beyond the scope of the current urban policies for guiding community planning practices. A comprehensive planning recommendation will be addressed in Chapter 10, synthesising the major findings and conclusions from Chapters 7, 8 and 9.

10. Planning Recommendations Towards More Socially Sustainable Neighbourhood Development

This chapter generates planning recommendations for future socially sustainable neighbourhood development based on the findings of the previous chapters. The three-layer assessment results can be summarised for the variations of social sustainability in different neighbourhood patterns, which reflect the shortcoming of the planning input behind this social outcome. The recommendations firstly address guidelines for regulatory planning that controls the entire urban form at the city level, and focus on the key physical variables regarding their discovered associations with social sustainability indicators. Secondly, there are more issues to be solved, pertinently those that relate to the change of social organisational form beyond the present urban physical form. A specific suggestion is proposed by establishing a collaborative system as a solution for Chinese neighbourhoods to move towards long-term sustainable development.

10.1 Creating a robust urban form: recommendations for the regulatory planning system

10.1.1 Summarising the existing spatial imbalance

The three-layered assessment initially indicates that the current neighbourhood forms have great variances in terms of the level of social sustainability. Findings based on the results of social sustainability appraisal in Chapters 7, 8 and 9 all suggest that certain types of neighbourhoods exhibit higher levels of social sustainability (Figure 10.1). The LSMD (Z=0.739) and MSMD (Z=0.592) present the best levels in terms of the overall social sustainability. Thus, adopting a large-medium scale and a medium density is a more suitable mode for neighbourhood development. For the overall social sustainability, the high-density, medium-scale (MSHD) type is slightly positive (Z=0.073); meanwhile, the low-density, medium-scale (MSLD) type is somewhat negative (Z=-0.174). The latter lower-density pattern of development was pervasive before 2000, but it is now rarely used because it provides relatively lower profits for developers in housing investment and it is an inefficient use of urban land for planners making urban plans. The worst pattern is found to be the SSHD (Z=-1.231), the high-density on a small site type. In fact, this is not a sound development pattern. The trend in using of this pattern, which has greatly increased after 2000, as revealed in Chapter 6, therefore, seems to be on the wrong track. In most Chinese

cities, the tendency of new constructions is still to undertake continuous urban expansion. More efficient planning instruments and regulations for the urban form, hence, need to be arranged. The neighbourhood-level planning practice will be a fierce battlefield.

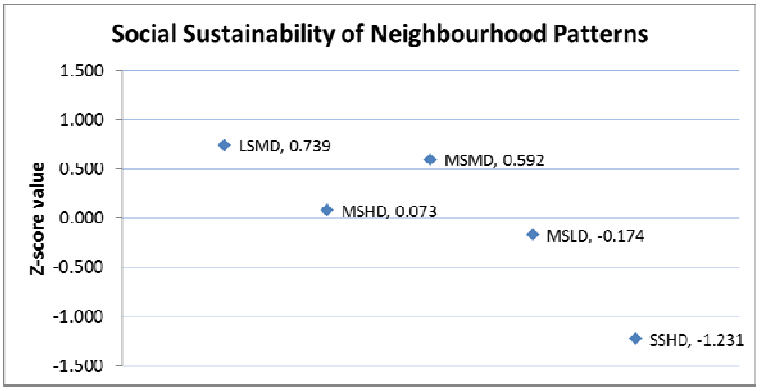

Figure 10.1 The social sustainability index for five different neighbourhood patterns

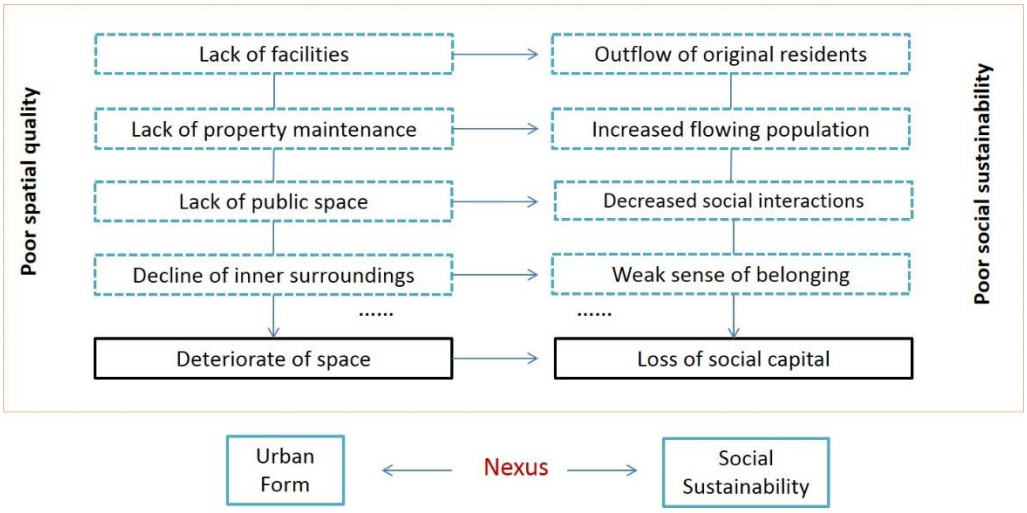

Figure 10.2 The nexus between urban form and social sustainability

Previous discussions in Chapters 7, 8 and 9 have presented an essential nexus between urban form and social sustainability, which is partly shown in Figure 10.2. Hence, planners should carefully determine the urban form to be utilised in the future. However, recommendations based on the findings are complex considering the actual planning system and neighbourhood practices in Shenzhen. Although the patterns of LSMD or SSHD are shaped by the combinations of variables site scale and density, the regulatory planning system controls these variables separately at different planning stages. The research thus has to review the process of creating the urban form rather than directly recommending these forms as a conclusion. More importantly, the cause and motivation of the shaping of unsustainable forms have to be explored and revealed. This requires the research to re-investigate the role of site-scale, density and other coefficients such as building coverage ratio at their unique stages. Hence, recommendations for regulatory planning guidelines

need to be generated by a synthetic review of the system.

10.1.2 Reviewing the urban form creation process

Shenzhen's statutory plan (SP) system, working as the regulatory process at the micro-level, is responsible for the creation of an urban form. Following national regulatory principles, the local statutory plan seems to be an integrated system, the focuses of which are on detailed land use, spatial intensity, road networks, and public and municipal facilities. This system also determines each neighbourhood's development by controlling a series of vital variables (these have been discussed in Chapter 3). The implementation of the SP system in the entire city is through the division of small 'planning units' (Figure 10.3), and detailed regulations are provided within each bounded area. However, these units are normally on a large scale which contains several urban blocks and dozens of urban neighbourhoods. Balanced developments inside these units is also proposed (Shenzhen, 2003).

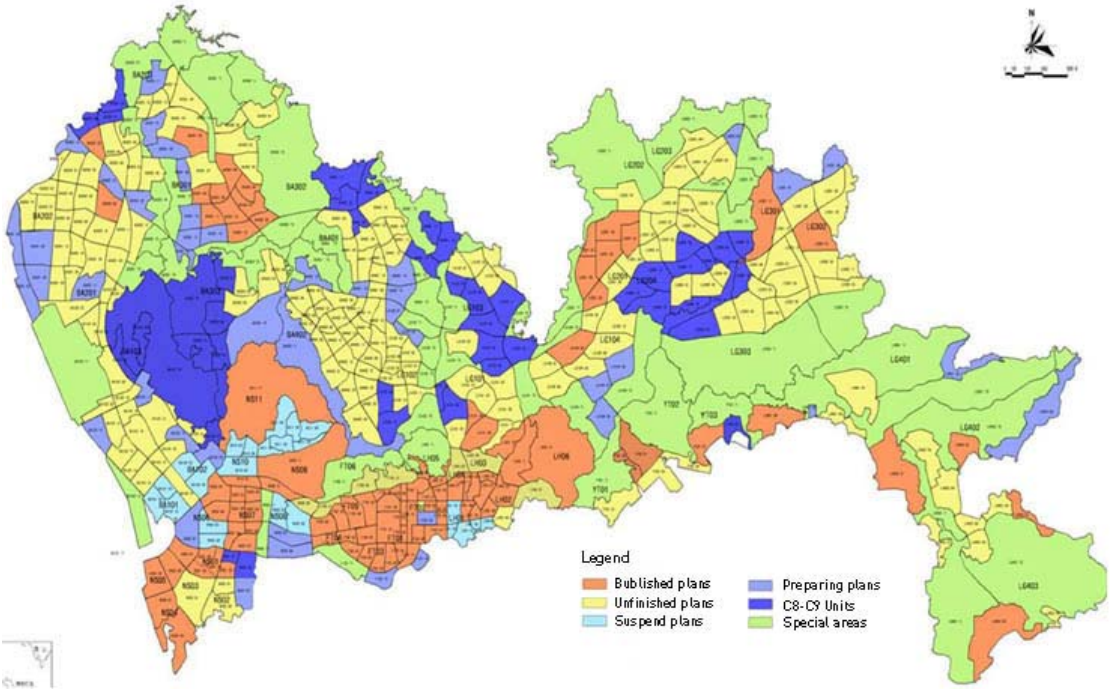

Figure 10.3 Shenzhen's statutory plan units (2009), including published, unpublished and suspended units

Recourse from http://www.suprc.org/product-fruit-i_8077.htm

However, according to the findings of this research, socially sustainable development has not been fully considered at the current micro-level planning processes. Issues of social inequity occur, although the local planning system aims to promote a great 'social harmony' (see section 6.1.2 in Chapter 6). For instance, regarding the urban block pattern, a fragmented pattern appears to be more unsustainable than a united form and is very significant in the discussions of internal liveability and social stability according to the

evidence presented in Chapters 7 and 9. This finding indicates that the local statutory plan system does not penetrate deeply in terms of the regulation scale. It initially aims to achieve robust development within its units, each of which, however, still usually contains 4 or 5 large blocks. A reasonable explanation for this issue is that the current system uses an inappropriate large scale of control without the necessary focus on lower-level development. Undoubtedly, significant spatial variations in terms of the scale and density of development suggest that the planning system has a lack of control at the neighbourhood level, and that variations in social sustainability between different neighbourhoods appears to be even more severe. Whilst spatial fragmentation and intensification have occurred due to the recent high-speed urbanisation, the lacks of attention and responses are a significant gap. The split urban form and 'injected' high-density developments can be found in many areas of Shenzhen, and also in many other Chinese cities. The local statutory plan system has not paid enough attention at the appropriate levels to promoting social development, although overall sustainable goals may have been articulated. This can be described as a typical 'top-down' logic fault in the Chinese planning system. No in-depth socially sustainable development can be achieved unless full consideration is not given to bottom-level neighbourhoods and their residents.

In China, the creation of a good urban form is regarded as a professional tool of urban planners. As stated in Chapter 4, the urban form regulation utilises a series of variables. In Shenzhen, no significant change is generated regarding the local context, except that the system is renamed as 'statutory planning' rather than the nationally used 'regulatory planning'. Thus, the question related to current neighbourhood practices still addresses the national regulatory planning procedure. Figure 10.4 shows the stages that control urban form, from which it is clear to see that variables are determined by a compound system, not by one or two planners. To be more precise, in the real planning process, the modes of MSMD or SSHD, although they exist, are not available to planners as multiple choices that could be easily utilised for neighbourhood development. They are in fact shaped by the planning system in a step-by-step process. Planning for a really sustainable urban form requires a systematic review of the entire planning procedures.

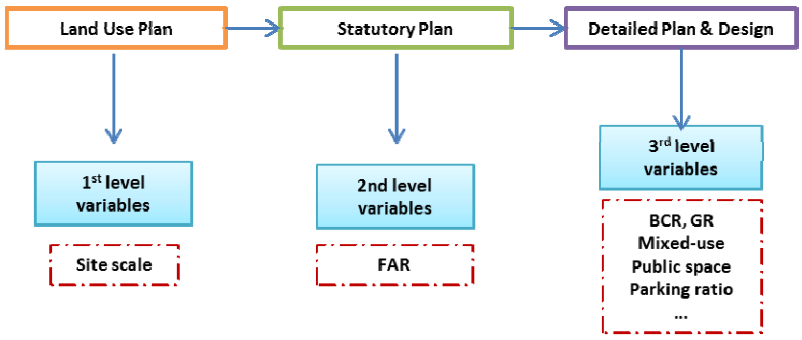

Figure 10.4 The hierarchy of urban form variables from local planning procedure

(drawn by the author)

In Shenzhen, prime urban form variables are controlled under a three-level hierarchy (Figure 10.4). The 1st-level variable, site scale (SS), is usually settled in the very beginning via land use planning. The SS value is assigned by the Shenzhen urban planning standards and guidelines (UPSG), which is 1-2 hectares in core areas and could be enlarged to 2-5 hectares elsewhere. However, this method of determination only makes sense for new development plots. This is because for existing areas, the scale of sites has become a fait accompli that is almost unalterable. The 2nd-level variable, density, is mainly represented by the unique index, floor area ratio (FAR). A decrease in density is affected by the increase of site scale due to a coefficient required by the regulation (Table 10.1). And for neighbourhood development, a FAR of 'no more than 6.0' is suggested by the current guideline UPSG. However, determining FAR is also affected by other factors and may not follow these guidelines closely. For example, an increased FAR near subway stations is allowed and encouraged. The 3rd-level variables include the building coverage ratio (BCR) and the greening ratio (GR) and others such as the mixed-use (Mix), which are mostly semi-restricted indices. Also controlled by the UPSG (urban planning standards and guidelines of Shenzhen), the BCR is required to be less than 25% in any high-rise development (ie. more than 10 floors), and less than 35% in the low rise and medium rise (ie. less than 10 floors). An overall 40% GR is also necessary for a neighbourhood project. Whilst not exceeding the maximum limits, there is some flexibility in detailed ratios of BCR and GR. Designers and developers can decide on other variables that do not affect the entire urban form without restrictions. For instance, providing a neighbourhood public space is encouraged by the UPSG, but there is no limit on its location and proportion. Thus designers can make inner surroundings of neighbourhoods in diversified ways. The parking spaces inside neighbourhoods can also be quite variable. The UPSG's advised ratio is 0.4-1.5 spaces per household. Interviewees A3 and A4 both suggested that the parking ratio may be specified by the CPDP (conditions for planning and development permission) but there is

still scope of flexibility.

Table 10.1 The FAR's variation coefficient with site scale, applied only to the resident land use type (R)

Site-scale	<=0.7 ha	0.7-1 ha	1 ha	>1 *	every increase of 1 ha
Coefficient of FAR Variation	-0.06	-0.03	0		-0.05

Note: it will be treated as 1 ha if an increase is less than 1 ha. Source: UPSG 2013 p.18

From the above review of the system, it can be seen that some regulations have been proposed for controlling urban form variables. A summary of the regulations on these form variables is given below: in practice, the site scale is a vital variable that greatly influences the urban form at the beginning, and does not have any flexibility at all. Another constrained variable is FAR, which is given as a core index in the local statutory plan system. It determines the total built-up area for a project and is thus of great significance. The BCR is a semi-flexible variable and the local bureau SZPL and its branches can have a 'discretion' to decide for each project what this should be. Since no clear guideline for practicing sustainability has been provided, especially in the regulations of each variable in planning implementation process, it is, therefore, not surprising to see many abnormal developments occurring such as extra-high and overly density projects. This indicates detailed regulations for each variable that written in CDDP, still often violate the principles of sustainability in planning practice. Thus, what should be reconsidered is not a simple step of choosing more sustainable patterns, but a systematic improvement of the entire planning process. Shaping a robust urban form requires clear guidance and effective control.

10.1.3 Remodeling neighbourhood site scale and density

(1) Refigure site scale in land provision

At the beginning of this research, a question was raised about what the appropriate site scale should be for a neighbourhood development. This issue has not previously been carefully considered by planners and was thus not known by the researcher before the study was undertaken. Now it can be initially answered with regard to the evidence of the case study in Shenzhen. From consideration of both the urban neighbourhood level and urban block level, it is clear that a proper scale for neighbourhood development is crucial. The role of a large-scale neighbourhood has been found to be consistently positive regarding the three layers of social sustainability. Similarly, a united urban form that reduces fragmented development is more sustainable in all assessments, in light of the comparison of the two urban blocks in the case study area Houhai-Dengliang. Community governance can also be considerably improved through an integrated approach. By contrast, the

adoption of a small-scale neighbourhood development has been found to have many disadvantages; clear evidence has been presented in each assessment. A fragmented pattern at the urban block level, as a consequence, is generally less socially sustainable than a united form in Shenzhen.

In 2013, the researcher discussed with local planners and officers how the site scale was presently controlled by the planning system and how it could be considered in the future. Interviewee B3 had a unique opinion on this issue from his experience as a planning practitioner.

> *'From one perspective, larger sites with considerable population can bring in a better quality of neighbourhood management. I would agree from an academic point that a larger site scale would present the potential for better social sustainability than others.'*

However, he also indicated that the result could be changed in practice,

> *'if, considering other perspectives, there would be a hot debate on the suggested solution of employing an absolute large-scale development. Transport may be a first arguable factor. Neighbourhoods which have mostly become gated at the present will not give any accessibility for outside pedestrians who want to pass through these areas. As a result, public walking routes may be affected if urban blocks are all converted into larger patterns by increasing site-scale directly. The main road network connectivity may be decreased, and motor transport may be influenced as well. Thus, there might be some disadvantages of this mode as well.'*

This interview reminds us that all things have pros and cons. A really sustainable model comes from a balance between multiple dimensions. Generating sustainable strategies also has to face an internal debate between various subjects and professions. Urban transportation, according to Xiang (2013), is considered at the earlier stage of processing urban land provision. It seems to have priority because of the importance of generating effective road networks and transport system. However, there is no preference for a small site scale from the point of efficient urban transportation. Transport planners dislike both too large and too small spatial divisions of urban land, as both of these options will make the road network either incoherent or overloaded.

Another limitation for the supposed 'large site scale' mode may be due to the reality of the urban land in Shenzhen. Officer A1 said that there was extremely limited housing land

available, and 'it may be not possible to provide large sites anymore in future' because 'land provision in future mostly relies on urban regeneration and land redevelopment'. Thus, the implementation of the ideal sustainable pattern in future could be bounded by a high level of constraints because of the practicalities of the urban contexts. With regard to social sustainability, one recommendation is to mainly concentrate on medium-scale neighbourhood development, in the range of 2-5 hectares (medium II) for Shenzhen, especially in newly developed areas. For many central areas of Shenzhen, a smaller scale between 1-2 hectares (medium I) could be accepted, because this mode is more feasible in urban regeneration projects that are experiencing great difficulties in redeveloping urban lands. Whilst positive sustainability appears most evident in large-scale developments, the promotion of this model, which is over 5 hectares, could be encouraged under certain circumstances. It could be promoted mainly in suburban areas where an effective public transport system with an uncongested road network can be developed. A united preparation for lands in the early phase of the land use planning thus is indispensable. The encouragement of this integration is a targeted treatment for the fragmenting trend on urban form. The existing pattern of small developments, which is usually under 1 hectare, and which has happened in the past decade, greatly splits urban structures into pieces. More seriously, there has been a considerably expansion in the number of extra-small development in recent years (27.63% among all neighbourhoods as discovered in Chapter 6, see section 6.2.2). These developments have been discovered to be extremely unsustainable, and should be largely restricted in the future.

(2) Limiting the high-density development

This research also raised a big question as to whether the continuous spatial intensification is socially sustainable. High-density development is a worldwide topical debate (Van Kempen and Musterd, 1991, Karakiewicz, 2004). It has been suggested as a solution to global oil shortages. Edward (2010, p.24) described that 'the current rush towards densification in countries with suburban sprawl, such as the US and Australia, seems to be linked primarily to more efficient use of public transport in an endeavour to reduce the utilization of the private car'. Generally in a Western context, high density with its compactness of urban form is argued to be a trend that is being embraced (Chan and Lee, 2009, Wright, 2010). However, in developing countries, the situation may not be exactly the same. Dave (2010) suggested that the high-density compact city model may potentially tackle uncontrolled growth patterns, for example in Indian cities. This evidence indicates

that the increase of density may have its reasons and positive roles. Other studies (Huang, 2006, Zhang and Lawson, 2009), in contrast, highlight the lack of social contact as an intrinsic defect of high-density residential neighbourhoods. This assertion, which is more concerned about social sustainability, also has a large number of supporters from the West (Ruchelman, 1977, Henderson-Wilson, 2010, Baldassare, 1982). However, planning strategies in China may need an adjustment regarding the rapid urban growth, as the role of density in this unique context seems to be more controversial.

The role of density, in fact, may be neutral. But it depends on the range and co-efficiency of other variables. China's current high-density development has been strengthened over the past 10 years, in which massive urban neighbourhoods have been generated. The increase of density to a certain degree can be acceptable. For example, some patterns using increased medium density (medium II, FAR between 2.4 and 3.5) also demonstrate a favourable level of social sustainability; for example, in this research, the LSMD and MSMD. This is a better solution to the pattern of MSLD (medium I, FAR between 1.9 and 2.4) which was a type of development mostly prevalent in the 1990s. However, evidence also shows the defect of high density. Higher-density development, i.e. over 3.5, especially the extreme-high density, i.e. over 6.0, may be associated with weaker social cohesion. The declined sense of belonging and reduced joining of social groups have been discovered in Chapter 8. Furthermore, the findings in Chapter 9 also suggest that the high-density atmosphere could not only be uncomfortable but also the levels of stability and safety could also be relatively weak. A serious issue for this mode is often a great lack of neighbourhood outdoor spaces due to the lack of control of the subordinated variable building coverage ratio (BCR), and together these factors directly result in the lack of inner facilities, playgrounds and public spaces. From the findings in previous Chapters, and especially the differences between the objective and the subjective assessments of neighbourhood safety, inhabitants may not be clearly aware of the issues of the intensification in reality. Hence, it is the planner's responsibility to discover these defects and work out solutions. Planning strategies could consider these issues and overcome shortcomings and disadvantages of small-scale and high-density developments.

Looking at the situation in the whole city, about 18.92% of neighbourhoods built after 2000 already exhibit a high range floor-area ratio (FAR>3.5), representing the fact that a considerable amount of unsustainable high-density development has already taken place,

which needs urgent restriction. Some projects that have reached an extremely high density (FAR>6.0) strongly challenge the social sustainability of urban development. According to the findings in this research, the medium density is ideally recommended for Shenzhen's urban neighbourhoods (FAR between 1.9 and 3.5). In this density group, the increased medium-high range (2.4-3.5) would be more welcomed. This is, on one hand, because of the relatively negative result of the medium-low density pattern in the social sustainability appraisal; but on the other hand, using a lower urban density seems to be unlikely for future practice because of the high pressure from urban land constraints. The high density (3.5-6.0) may be acceptable for some centrally located areas. However, restricted control for the extreme-high density pattern (FAR>6.0) should be implemented in future planning practices due to its significant disadvantages in terms of social sustainability.

Efforts can still be made to promote the social sustainability of the existing high-density neighbourhoods. Enhanced urban design can also improve the existing environment (Hopkins, 2005, Karakiewicz, 2004). Some studies (Buys and Miller, 2012) even found that some high-density residents were still satisfied with both their neighbourhoods and dwellings. Thus, the social satisfaction of some high-density developments, for example MSHD in this assessment, is still acceptable, with more supervision and improvements. From Singapore's experiences, it can be seen that public facilities, public spaces and green spaces can still be well maintained via its enhanced 'vertical development plan' (Han, 2014). And there will also be social intervention opportunities as solutions, which will be addressed in the latter discussions. These could be suggested as an alternative solution for many existing Chinese neighbourhoods.

10.1.4 Strengthening the implementation and integration of local plans

The previous analysis was tailored to the earlier procedure of making plans. Despite a lack of detailed policy for promoting social sustainability, the regulation system may have some initial considerations in its technical controls (Municipality, 2013); for example, for density, a FAR value over 6 is regarded as improper. However, many recently appeared developments have greatly exceeded this limitation, either lawfully or unlawfully, which strongly challenges social sustainability. Thus, the current regulation system turns out to be unable to control the rapid urbanisation process. A introspection of the process of planning implementation is as important as the above discussed creating proposals for a sustainable urban form.

In the real neighbourhood development process, developers receive tangible requirements through a detailed notice document containing multiple variables, the 'conditions for planning & design permission' (CPDP). Detailed neighbourhood designs and constructions have to follow the CPDP instructions. Interviewee A3 introduced more details of the urban form control procedure from the CPDP:

> *'For each neighbourhood project, a CPDP document is issued by a corresponding SZPL branch on which key variables are completely listed, such as the FAR, SCR, GR and PR. Many other conditions are also attached in a CPDP for detailed design, including site boundaries and their draw-back distance from main roads. However, these variables and conditions usually have to be determined one by one regarding the needs of actual development.'*

CPDP is one of most crucial work forms for SZPL branches that regulate and guide urban projects in detail. As a fundamental control, the determination of variables needs to be very carefully considered. Special discussions are often organised to seek expert support. However, after reviewing the submitted design proposals from developers, the final approved results can still be different from the initial specified requirements. Interviewee A4 additionally explained some regulations in practice:

> *'For a neighbourhood project, the parking space ratio could have some flexibility and occasionally the total built-up area may also have minor adjustments. However, there is a very restricted control on the FAR; meanwhile, the maximum of SCR and GR cannot be exceeded.'*

From the above discussion, the regulations can be applied variably, with different adjustments available for different variables. The variable site scale would be solely decided by the SZPL in new-site-based projects without other stakeholders' involvement. The control of site scale in urban regeneration may be from a negotiation with the related stakeholders; currently, more than half of the neighbourhood developments are of this type (Shenzhen, 2011a). Other variables are determined at the regulation stage and most conditions and restrictions are provided on the CPDP for neighbourhood developers. In practice, FAR is not only a purely technological index but also a critical trade-off of interests (the evidence from this interview is protected by anonymity):

> *'The FAR might be given higher with an exchange condition that nearby public facilities could be additionally constructed during a neighbourhood development.'*

An increased FAR means additional profits, which, in return, can pay off the higher costs of development, particularly the proportion of unplanned investments due to the request for

building additional facilities in neighbourhood plots. Hence, if the developer would like to accept this type of 'offer', an increase in density is still feasible in practice, regardless of the extant FAR techniques. As a public policy with significant influence (Sun, 2009, Bao and Li, 2010), the FAR's decision-making has to be transparent. However, the current opaque process increases a risk of potential 'power-for-money' deals (Chen, 2013).

So far the investigation has discovered several issues inside the current planning system. Firstly, there is a reminder on the importance of planning implementation, although the statutory plan system in Shenzhen has already been indicated as more legitimate than in other Chinese cities (Bruton et al., 2005) and hailed as a successful 'Shenzhen experience' since its implementation in 1999 (Du, 2010). The shaping of a statutory plan takes a standard process comprising three main stages and 12 subsidiary steps, from an initial draft to an internal review and finally to formal adoption (Shenzhen, 2003). Each statutory plan is reviewed and approved by the 'Urban Planning Board of Shenzhen' (UPBSZ). This supposed 'advanced' system, however, was found not yet been fully implemented at the bottom-level neighbourhood development, and many unreasonable results occur in real implementations. From the evidence of the FAR regulation, some proposed administrations may be ineffective, as the decision-making process is still illegitimate and opaque in front of the public. The implementation process is equally important to the previous section of creating the urban form, because it focuses on the realisation of the proposed urban form. A key point for a legal implementation is that the government should also have absolute neutrality, with no interest throughout the whole planning process. Both government's means of configuring money and space are facing a challenge. Especially at the early stage of urban development, the regulation should contain restrictions and must not allow developer to place any potential social burden on the residents. Some important spatial regulatory indicators have too much emphasis on initial guiding but are not binding enough, such as site scale and density. This explains why there are great spatial variations in local neighbourhood development, in which considerably unsustainable patterns have been generated, either consciously or unconsciously. However, in terms of managing facilities, the system becomes rigid with poor adaptability and is incapable of addressing any change in residents' basic needs. As it is difficult to cooperate with multiple stakeholders, the plans are often under frequent revision, which weakens their legitimacy, which also in turn accelerates the possibility of changing spatial patterns to seek additional profits.

Secondly, although developed as an advanced platform, the statutory plan (SP) system still lacks an integration of resources within its units. A controlled development of public resources may have been a core inclusion of the SP system. This should be an advantage of the current planning system under a powerful local authority. For example, in the HD area where the research was undertaken, many basic public facilities were found to provide a positive level of satisfaction. However, variation also occurred in certain types of facilities; the lack of sports and social welfare facilities especially has demonstrated a potential gap of the system. As stated in Chapter 7, these facilities have nowadays become more privatised and enclosed within the gated neighbourhood form. The same issue has with neighbourhood public space, which has greatly deteriorated in small-site developments. This can be identified as a ubiquitous problem for the gated neighbourhoods, but there is no regulation/design guideline or any reuse plan within the current system. The system has to integrate the plans at the bottom scale and connect the current diversified urban resources via the implementation process.

The unmatched systems and dual planning-management boundaries could also accelerate the lack of concern regarding the bottom-scale neighbourhoods. By the end of 2012, 187 units had been fully planned among the total 225 SP planning units across the entire metropolitan area. Now the planning for the remaining units is in progress (Ye et al., 2012). However, these plans are often at a too large scale due to the broad boundaries of these units (Figure 10.1) and can hardly be transformed into tangible assets that benefits their neighbourhoods and residents. There is a new trend in China that urban planning strategies at different levels should be more integrated with each other in order to avoid planning gaps and prevarications (Shen and Xu, 2015). Currently the regulatory boundaries do not coincide with administrative boundaries. The first set, which covers large-scale plans comprising a total of 226 planning units in this metropolitan area, should be adjusted to an administrative community 'Shequ' scale, which has about 800 units in Shenzhen (See section 5.1 in chapter 5). For a robust urban form, this research also has to point out this issue. There should be a responsible bottom-scale plan to coordinate the bottom planning practices. Several residential neighbourhoods could be planned in a more localised and more integrated manner. A cooperative approach of a large urban community sharing nearby facilities and resources benefits everybody. Many existing special plans, such as educational plans, are still at the municipal level. Thus, there is a lack of integration of these resources for each community. The future configuration of most urban plans should

consider using community-sized basic units, in which the promotion of 'social harmony' can be really underlined by a more integrated and balanced development starting from the bottom scale.

In summary, as the controlling regulatory planning has always worked from a top-down perspective before, there is limited involvement of residents and reflections on the requests from those at the bottom level in existing plans. More integration is required when a new regeneration project takes place, as nearby neighbourhoods will be influenced and the sharing of public facilities may be under a consequent shortage. At the present, the split urban form and uncooperative plans have little concern for these matters and thus great variation in social sustainability occurs, which shapes a further social inequity. The gated neighbourhood form accelerates the separated use of the facilities and spaces. As a result, longitudinal and transverse collaborations can also be seen as critical for improving the planning system towards the creation of a more socially sustainable development. And this can also be connected with the existing neighbourhoods' management practices, which also requires a more cooperative mode, which will be discussed in the next section.

10.2 Shaping a cooperative social form: recommendations for the governance of existing neighbourhoods

The city of Shenzhen now has no alternative but to seek a transitional pathway for both the new development and urban regeneration, and undoubtedly the latter has become the major priority for Shenzhen because of many tangible constraints on further urban expansion. Although the demolishing and rebuilding urban form is impracticable for many existing neighbourhoods, there is still a lot of scope to improve them, whereby a cooperative social form could equally enhance social sustainability. A sustainable neighbourhood development is not only related to the shaping of a good urban form, which has been addressed in the previous discussion, it also can be developed by promoting the development of social capital, as discovered in Chapters 8 and 9. Hence, a practical approach to solving problems with the existing neighbourhoods is also vital. Urban regeneration[16] in Shenzhen is officially described as the major tendency for forthcoming urban development (Shenzhen, 2005). Its related policies have highlighted the

[16] The site area of one 'urban regeneration' project defined in Shenzhen must be over 10,000 square metres (1ha), as the government has clarified in the guidebook.

implementation of a sustainable regeneration to recover or renew neighbourhoods rather than rebuilding them following a complete demolition (Shenzhen, 2012b). Urban regeneration is a redevelopment process during which the rights and interests of all parties must be guaranteed. To achieve a harmonious process, urban regeneration requires a honest lead from the government, efficient operation of the market, and a necessary balancing of multiple stakeholders' interests (Shenzhen, 2012b).

10.2.1 Behind the urban form, a trade-off between stakeholders

A continuous focus is still required after the build-up of a neighbourhood (Xu and Chan, 2011). It involves coordination of public facilities and community governance, in which a number of different stakeholders have to be involved. A socially sustainable process of neighbourhood development should also clearly hear the various voices of the stakeholders in order to determine future plans. A current gap, as discovered in Chapter 9, is the lack of a collaborative mode that could link the interests and requests of multiple stakeholders together. Seeking a win-win approach needs to discuss what their requests in reality are and how these requirements can be accommodated in an appropriate system. Figure 10.5 presents the complex relationship of the neighbourhood stakeholders involved from the beginning of planning process to the end. During the first stage, local planning bureau and governmental planners have to coordinate with neighbourhood developers and their consultants. As the Chinese urban neighbourhoods becomes mature, the key stakeholder becomes the residents, usually hearing through their committees who have discussions with property management teams and local community offices/stations. Conflicts emerge often due to multiple perspectives and requirements, which potentially challenges the current Chinese planning and governance systems.

Redeveloping plans for the existing neighbourhoods further requires a review of the social institutional structure and coordination of the interests of different stakeholders. Further interviews were carried out to gather the main thoughts of various stakeholders. Although the relationship is already complex, major points can still be sorted out from their statements and materials.

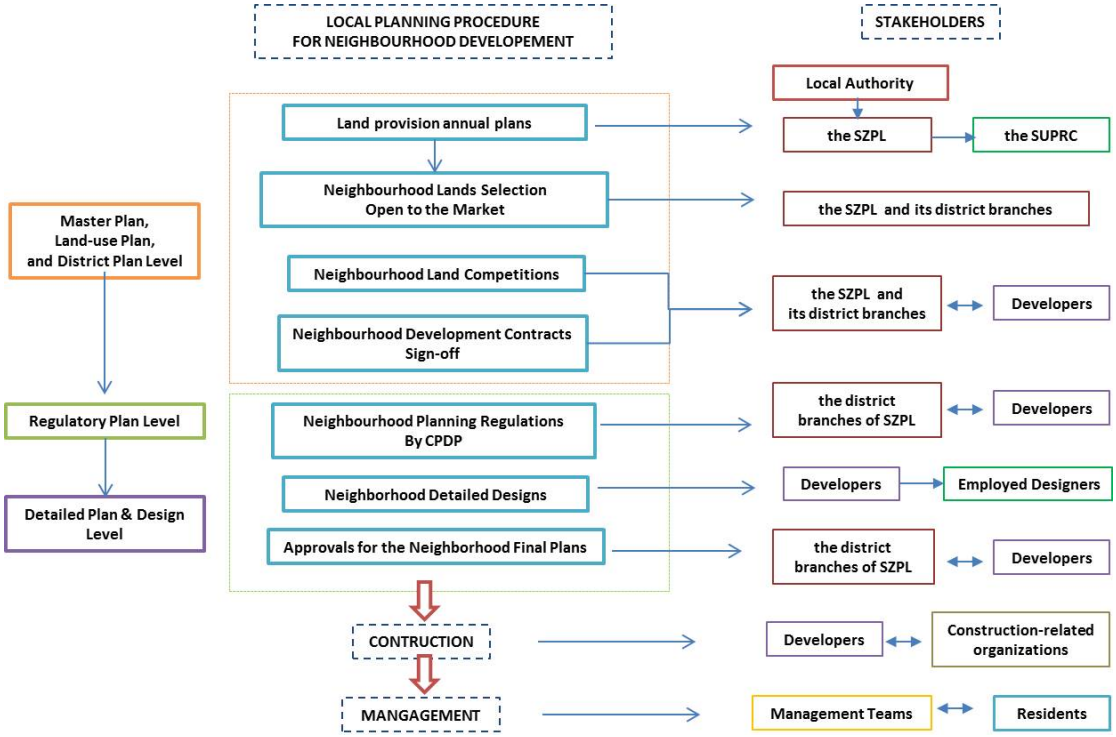

Figure 10.5 The current working mechanism for all the related stakeholders in local neighbourhood development process

(drawn by the author according to local official planning documents (Shenzhen, 2012b, Shenzhen, 2013)

- **Neighbourhood Developers**

Interviewee E1, an employee from a large real-estate developer in Shenzhen, stated above and indicated that there were great difficulties for developers in genuine neighbourhood developments.

> *'The inadequate land provision increases a great competition among neighbourhood developers under the continuing growing housing demands. As the local bureau has a strong dominant position in the dialogue of land provision and planning control, they can have certain higher requirements on each site; for instance, sometimes they require us to bring supporting facilities with the development of neighbourhood together, which will definitely increase the project cost for us.'*

From the perspective of a developer, the profits and investment cost are still an important rationale. However, many large developers still think that creating neighbourhoods with a pleasant social reputation is of great importance. In terms of the responsibility to create socially sustainable communities, many developers also suggested that policy needs to be written as an agreed chapter to clarify the boundaries and duties of the government and developers, by which the social development could be guaranteed in future. But in general,

it was a surprise to find that developers were also discontented with the current planning mechanism.

- **Third-party planners**

But sometimes an ideal win-win plan cannot be effectively organised and finally shaped, especially regarding the lack consideration of other stakeholders. This is first because the planning bureau often hopes to have each site developed quickly and linked to some other benefits, for example increasing many public facilities together with a neighbourhood project. The starting point of the bureau may be good, but due to some developers' practical pursuit of profit, any supplementary development may be finally added to the costs of residents. But the facilities may still belong to some authorities not these neighbourhoods in the final operation. The current planning process, without transparent and legal cooperation, could be dominated by the planning bureau and developers, which has been found to mitigate against providing a socially sustainable outcome. Interviewee C1 stated the following:

> *'There seems to be a system defect in neighbourhood planning and real-estate development in Shenzhen. Developers sometimes have to increase the FAR in order to make up for their developing costs. In terms of project returns, powerful developers might sometimes pay attention to brand-making and social benefits of their projects whereas small companies only attach importance to their profits and cash flow efficiency.'*

- **Governmental planning officers**

Unbalanced spatial configurations result in great social injustice. This has been widely agreed by many planning officers in Shenzhen. They assert that major problems for bottom-level neighbourhood development are from the diversified investment and management of neighbourhood infrastructure. From the introduction of interviewee B4, a planner in SUPRC, maintenance and regeneration using a top-down intervention seems to be impossible:

> *'Generally speaking, neighbourhood facilities improvement would mostly rely on self-management, which has been shown to be inadequate in many cases. Separated investments by various developers at the bottom scale is a major reason. It is common to see their unconcern of future regeneration, especially for some older neighbourhood, the maintenances of which are now very difficult. Furthermore, although public participation has been introduced into the planning process,*

currently there is still less public participation after the development of neighbourhoods. The voice of improving neighbourhoods is far from reaching our system. Some spatial resources are improving by some special policies, such as the city elderly welfare special plan. But they are usually generated for city and district levels and have not yet been implemented at the bottom scale. The leadership of a neighbourhood regeneration is even more unclear.'

- **Residents' voices**

Numerous residents reported issues with current neighbourhood management that need cooperation. Points from residents mainly focus on the issues of spatial injustice, and the potential growth and sharing of facilities. For example, interviewee F1 from neighbourhood LSMD-1 illustrated that parking has been a significant issue for a long time but no response has been received so far:

'For our neighbourhood, the most difficult issue is the extremely limited parking space. The gap is sharp and conspicuous: there are just over 1,000 parking plots for our residents compared with currently 2,300 car owners. The total demand is estimated to pass 3,000 soon, which is definitely bigger than 1:1 and much higher than the original design 1:0.6.'

Some radical inhabitants blamed the relationship between the local government and real-estate developers who had not done their job correctly and left a lot of issues. However, most of them could understand that the difficulty was also because of the recent growth in car ownership, which was beyond the expectations of planners and developers. Thus, the genuine disappointment or dissatisfaction was from the lack of an effective cooperative mechanism to solve the new problems. 'This is absolutely a great challenge as our neighbourhood needs resilience to grow', stated interviewee F4. He thought it was highly connected both to local urban planning and the local community governance and more attention was needed for establishing a better collaboration between these elements.

- **Property management team**

'The major responsibilities of the neighbourhood management team are security control, parking control, maintenance & repair for inner facilities and greening, and provide other basic services for neighbourhood residents. Usually we are under the supervision of the residents' committee'.

Interviewee G1 also indicated that the quality of neighbourhood management varies greatly in Shenzhen. For large developments, the management quality could usually be guaranteed.

However, the maintenances of many small neighbourhoods is in a weak situation, as small developers, who are often profit-led, often leave many problems. Their residents could change management team, and some have actually done this frequently, but there is no responsible party to complain to regarding deterioration of the neighbourhood's inner surroundings. This is also because of difficulty in getting a management fee from the high numbers of the floating population. However, a common issue is that what these service can do is limited to inside individual neighbourhoods. Many issues that remained unanswered crossed neighbourhoods. For example, there have been disputes about the recent proposal to build up a new local community-shared library; agreement on its location and maintenance has not been achieved, as it crosses multiple nearby neighbourhoods. These, in fact, are typical questions that are raised in many similar urban neighbourhoods which require a cross-boundary coordination.

- **Community Officer**

Community officers often get complaints from residents on real difficulties of their neighbourhoods. For example, they have been aware of the parking difficulty for a while and have thought over its solutions. According to the community officer D1, the chief of Weilan community station:

> *'The nearby roadside greening spaces, which are just outside our community station and are currently in one single use, may possibly be converted into public parking spaces. It may be privately hired by residents who have a demand through a timesharing use of these spaces. I think it is a feasible way. There are a large number of similar spaces around the entire Houhai coastal area that might be also considered.'*

Although to increase parking spaces using roadside greening spaces, which are potentially available, sounds like a good suggestion, interviewee D1 still had no idea how to put this proposal into practice, as the community management system is run separately and in parallel with land use and regulatory planning. Thus, a more efficient exertion of neighbourhood nearby urban spaces, however, is beyond what the current community scheme can do.

> *'The biggest problem is no official guidance at the neighbourhood level for its operation, maintenance or regeneration exist. No one knows how to do or whether it is the right thing if we do so. Sometimes we feel that there might be some laws or regulation on our neighbourhoods, for example, the facilities and spaces. Although we have felt the pressure and inadequacy of them for our neighbourhoods, many*

people still do not want to do anything because they do not think it would be their obligation. I think more forthcoming work can focus on the roles and responsibilities of different stakeholders. For example, a clear guideline for our local community stations, so that we, or maybe someone else, could re-organise neighbourhood management teams, our neighbourhood committees and mobilise some social capital. A system should be better established so that our neighbourhoods can be improved.'

- **A synthesised review of different stakeholders' points**

Two principal conclusions can be drawn from the above discussions. The first is that almost every stakeholder has accepted that social sustainability is absolutely essential in the planning process, for both the present and the future. The confirmation of this point again reminds us that a proposal for socially sustainable neighbourhoods is of great significance, and this consensus can be the foundation for a cooperative approach to achieve social sustainability. The second assertion comes from the judgement on the hot debate concerning what they can do towards promoting social sustainability, and it is crucial to establish a reliable cooperation system as a practical approach. The interviewed planning officers and governmental planners seemed to argue about the limited role of what the current planning system could do. Neighbourhood committees and residents expressed their points that the local authority sometimes did not do anything when they should do; but sometimes, on the contrary, put too many unnecessary regulations on them, hindering the cultivation of bottom-up social movements. Even some third-party planners and open governmental planners agreed with this and suggested that external social forces could play a more positive role instead of the current single top-down intervention. A conclusion is that further work is required to enhance the current system. To promote sustainability, it is indispensable to consider a wide range of cooperative activities throughout the entire neighbourhood development process.

10.2.2 A cooperative sharing of facilities and spaces crossing neighbourhoods

The provision of neighbourhood facilities has been emphasised as a key component in Shenzhen and China (Shenzhen, 2007, Wang, 2013). Chapter 7 presented the evidence that many amenities mostly satisfy local residents expectations. These include educational, healthy and commercial facilities. In Shenzhen's planning practice, detailed regulatory plans distribute these facilities outside neighbourhoods as public facilities under the general

guidelines of the city's master plan. There are also specific plans which focus on certain types of facilities, such as for Shenzhen healthy and educational facilities, in which their exclusive networks can be built up inside the city and districts (UPDIS, 2005).

However, evidence still suggests many issues that need to be considered. First, attention still has to be paid to the potential growing demands on facilities. For instance, hospitals and healthcare centres may no longer be adequate in many mature urban areas with the gradual improvement of people's living conditions and associated expectation. As basic services have been provided, people tend to engage in more high-end, diversified, individualised cultural, recreational, leisure, sports and fitness activities. Thus, inner-neighbourhood facilities, which are currently in fixed amounts, may also need a gradual growth; upgrading related cultural and sports facilities should also consider diversified modes and categories. Many existing public facilities are planned with single land-use under unique provisions led by different local authorities, like schools and hospitals. The increase and redevelopment of these facilities may need to be through special plans with a great upper-level coordination.

On the other hand, although large neighbourhoods are more capable of accommodating more facilities; there still appear to be great shortages in sports facilities, social welfare facilities and neighbourhood public spaces in certain existing neighbourhoods. However, as initially provided by developers, many of those have been included in urban public categories and are beyond the focus of the local statutory plans. These inner facilities, which may be under escalating demands as well, however, have to be reinforced through an external solution instead of an internal approach. Furthermore, the lack of appropriate public spaces may also impact on resident willingness to engage in social interaction, and this means that they are less well acquainted with each other and consequently share less information or discuss community issues.

Furthermore, in the gated urban form, diverse developers and unrestricted regulation infer an imbalanced development of these spatial resources, which, indeed, still affects the neighbourhood social sustainability. To avoid disappointing social consequence, the bottom-level governance should consequently be targeted. More specially, for neighbourhoods where the private sector is unable to provide further solutions, public intervention is still necessary. More spaces could be generated for neighbourhoods by

converting and sharing nearby resources and alterable spaces regarding future demands can also be prepared via local cooperation. The research thus emphasises a convergence of both the private and public spaces should be targeted for neighbourhood use.

10.2.3 A cooperative model of local governance and redevelopment

Another major issue that remains in the current governing approach is the low level of public participation and collaboration. Worldwide planning studies have demonstrated the importance of public engagement in neighbourhood long-term development. For example, Woodcraft et al. (2011, p.40) indicated 'sustaining residents' voice and influence in the long term means putting robust engagement and governance arrangements in place that are sensitive to local needs, and thinking about how these will be funded into the future'. Evidence in Chapter 9 clearly shows that there is insufficient participation at the present. However, this does not mean that inhabitants are not willing to participate. In the case study, evidence suggests that residents were found to be willing to and confident about managing neighbourhoods because of a high awareness of their neighbourhood-related issues and the appearance of a strong self-governance ability. In fact, what most residents felt was the lack of an effective communication channel to facilitate this work.

Social capital is growing fast in China. The past few decades saw a restructure of social relationships and social forms for most Chinese city dwellers. This is mostly because of the disappearance of the old 'work-unit'(Danwei) and the emergence of the new 'social community' (Shequ). The social form has been reshaped from a strong mutual-relationship as colleagues of a work-unit to a weak membership of a geographic urban community, in which mutual trust and collaboration have not been established. However, bounded by an tangible attachment, community-based social capital is growing quickly (Huang and Gui, 2011, Qian and Shenjing, 2012). The assessments in Chapters 8 and 9 further focused on entire community development issues such as neighbourhood cohesion, stability, stewardship and governance, which are beyond the current scope of local plans, which are concerned more about the issues of improving public facilities and physical surroundings. The findings of the two chapters indicate that the development of social sustainability not only comes from physical control but also can be improved by enhancing neighbour social ties and community social development. Thus, the governance system should greatly encourage social groups and social capital of urban communities in future.

But how can the social capital's participation be integrated into the system and contribute

to social sustainability? Two aspects can be considered for this process: adjustment in internal institution and seeking external collaboration. What has happened in Shenzhen is that many community offices have encouraged social capital to become involved in community service instead of the traditional administrative governance. This has been proved, both by the researcher and governor, to be very effective in increasing social satisfaction (Xiang, 2012, Zhang and Yan, 2014). Furthermore, some problems, such as the parking difficulties that have been highlighted by many neighbourhoods, require a higher level of cross-boundary cooperation. This may not be possible for residents and neighbourhoods to solve internally. Large-scale collaboration (with and within the boundaries of administrative community offices), therefore, can re-unite split neighbourhoods into a joint group. The connected space between nearby neighbourhoods could be integrated by a reorganisation of management, sharing of resources and mutual assistance, which could help to overcome many typical difficulties because of the split form and solo governance. In summary, there is a great space for community development to grow from the perspective of a collaborative mode, which can be seen as a regeneration for the entire social form.

The role of a new community-based 'planner' or 'supervisor', accordingly, is also required to follow this transformation. The work needs to be integrated into a community office/station with a deep understanding of local contexts. Their forthcoming work has to focus at the bottom scale, which will be very basic but tangible; for example, supervising neighbourhood maintenance and management, providing planning knowledge and expert support, developing residents' ability for local autonomy. The expression of aim and objectives also needs to be provided through plain drawings and words, which can be easily understood by the residents (including urban villagers). This goes further than the previous discussion on improving physical planning technologies; it requires more reconsideration about the planner's social role in this constitutional optimisation.

10.2.4 Mending the gap by embracing a public-private partnership

As stated above, a collaborative approach for guiding neighbourhood development is beneficial. However, as still unfamiliar to most Chinese residents, officers and even planners, the system requires a leadership as well as clear roles for each stakeholder inside this organisation. The potential solution of a collaborative mode also needs a successful exemplar. The experiences of the UK 'Community Architecture' movement since the 1970s have indicated some common characteristics for successful community regeneration

projects (Wates and Knevitt, 1987). Residents were discovered to be willing to be responsible for making regeneration plans through individual or collective participation in order to reshape or recreate their own environment. In this process, residents democratically produced their social organisations for their communities, although advice from external organisations was still indispensable as professional support from either single or multi-disciplinarians. A creative collaborative relation was established among residents, communities and external experts. New plans were generated based on considering the real needs and abilities of residents in the light of which the local environment could be gradually updated. This Western experience reminds Chinese urban policy-makers to establish a bottom-level collaborative system for neighbourhood development, and it should not only rely on the appropriate interventions from the government, which is currently strong, but also on the establishment of a partnership with communities, residents and developers. Considering the tradition of top-down planning, strengthening a public-private partnership for the existing urban neighbourhoods is more practical rather than placing a great emphasis on a solo bottom-up approach as a replacement.

Generally speaking, an innovative public-private partnership (PPP) is a supplement to the current planning system. This partnership ensures the realisation of the common goals of development, e.g. a sustainable neighbourhood, through the participation of multiple parties. It emphasises actions towards fringe and grey zones, cooperation between multiple stakeholders, and a balancing of development interests. As revealed in Chapter 7, a system weakness is clear in some grey zones of neighbourhood development, e.g. the provision of sports facilities, public space and parking space. The private sector shows some overemphasis on profit in the housing market; meanwhile, the public sector's lack of intervention in those neighbourhood issues is clear. For future neighbourhood development, the gaps and disparities in certain discovered margins and grey zones can be effectively mended by implementing the suggested PPP system, which is also a positive means by which to protect the interests of residents against the enlarged social inequality. The application can also be extended to social service and neighbourhood governance.

A close relationship between the public and private sector is required to shape balanced planning decisions towards sustainable development, especially considering the fierce trade-off between neighbourhood stakeholders that was discovered in Chapters 4 and 9.

Respective advantages for each party can be found inside this partnership. For the public sector, e.g. local authorities, the lack of ability to improve neighbourhood facilities and spaces can be overcome by bringing in resources and capital from the broad market. Social service led by this partnership can include more socialised operations, which can remedy the discovered system weaknesses, especially the inefficiency and bureaucratisation in current hierarchal governance. Social satisfaction of neighbourhood governance and service can be improved as a consequence. For private sectors, with the support of local governments, they could extend their business with more investment opportunities in housing schemes, neighbourhood management and even some new areas, e.g. a shared parking system. However, residents are also a beneficial party as a result of this partnership; the satisfaction with basic needs, social network and community development are all expected to be strengthened with the implementation of this PPP system.

This partnership particularly requires both the local government and developers to reposition themselves. Firstly, with the many discussions on the social transformation in China, policy has to reconsider the role of the government in future neighbourhood regeneration processes. Recently, official plans have proposed some initial attempts to seek exogenous solutions for neighbourhood regeneration. For example, the policy (Shenzhen, 2012b) stated that important interests of stakeholders will be listed before making new plans; cooperative discussions are indispensable. Although some special plans should still be led by the government, for example in the project relocation and/or compensation scheme, most redevelopment plans have to be determined by local opinions using collaborative planning. Secondly, the role of private neighbourhood developers needs to be re-defined. For the gated neighbourhoods, the responsibility of providing necessary adaptation and regeneration has to be on the developers, who have had certain benefits during the initial real-estate development. For the type of small-scale high-density neighbourhoods that with obvious defects, their developers can be re-organised and together propose a new integrated plan for a more balanced local development. Cross-boundary cooperation could be utilised for larger-scale redevelopment and a united community management should be encouraged.

As a prior stakeholder, each ‘community’ should be the real organiser. A community dialogue mechanism between multiple stakeholders for negotiation is the first step. Residents are more encouraged to participate in the process of redevelopment and be

responsible for preparing plans considering their genuine demands. This means residents could become deeply involved in a redevelopment plan and play a fundamental role in this cooperative system, despite it often needing technical support. Information on planning processes has to be frequently released to help stakeholders understand the benefits of new strategies and redevelopment plans. As a matter of fact, a future 'community plan' has to be a comprehensive plan. The entire process need to be visible and controllable, and ultimately benefits multiple stakeholders through a win-win system. In summary, the proposal of a new public-private partnership aims to optimise neighbourhood development through a cooperative organisation and an interactive planning process. Enhancing a public-private partnership is currently an effective way of establishing a neighbourhood-level collaborative system, which can hopefully also reshape a cooperative social form with this community-led, collective decision-making process (Figure 10.6).

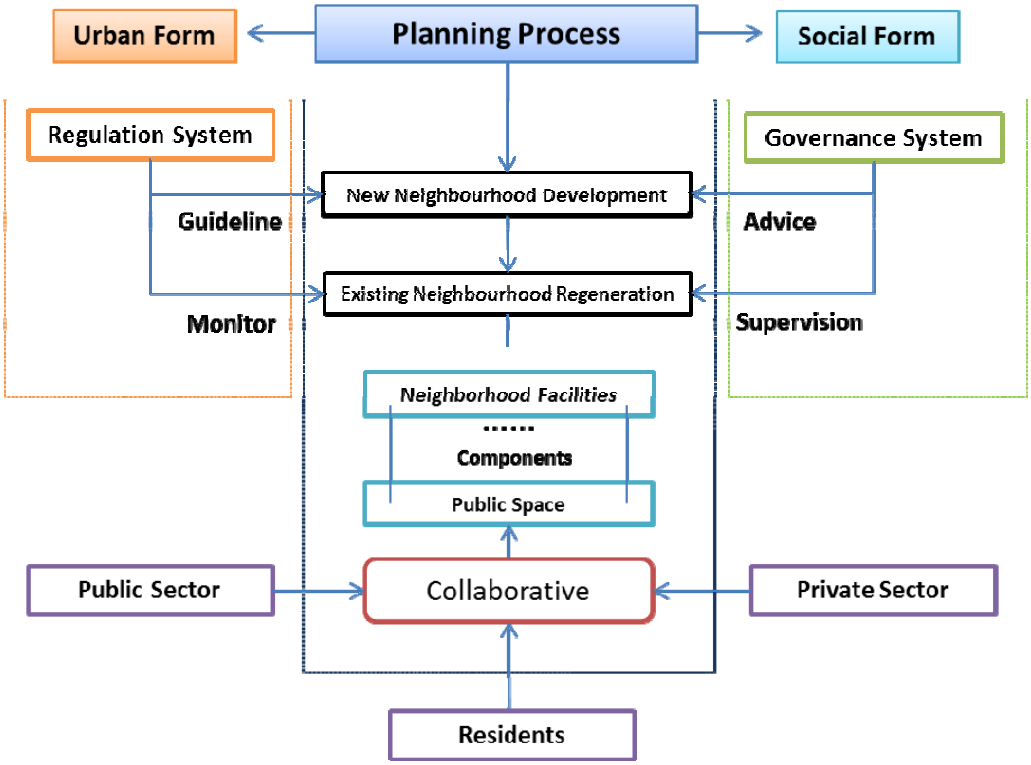

Figure 10.6 The recommended collaborative planning process

(drawn by the author)

10.3 Conclusion

Enhancing social sustainability is a systematic process that needs to be carefully considered for both the new development and existing governance. The research has given detailed recommendations regarding each in this chapter. A robust urban form for neighbourhoods is the first step that could be put forward inside the current planning system. Certain

patterns of urban form have not been created appropriately in the past with lack consideration of social sustainability, and its reason is related to the defects in the planning, regulation and implementation processes. For existing neighbourhoods, what the research proposes for the governance system is a powerful improvement via a cooperative mechanism connecting the key involved stakeholders. A feasible suggestion is to establish a new public-private partnership for future neighbourhood growth. An internal adjustment for the planning system is currently pressing and a sustainable urban form could only be facilitated by enhanced planning regulation and implementation. In the meantime, external collaborative governance is also of great importance, which indeed is a reshaping of a new social form under the great social transformation simultaneously happening with the rapid urbanisation.

11. Research Conclusion

This chapter draws a final conclusion for the thesis. It comprises four key findings which are the targeted responses to the four research objectives developed in Chapter 1. The core of this research, the appraisal of social sustainability of Chinese urban neighbourhoods, indicates a unique perspective of considering the socio-spatial interaction in urban planning processes. However, this research project also has some limitations. A continued focus is necessary and future scope for this topic is also suggested at the end.

11.1 A summary of key findings

11.1.1 Understanding the new urban form as a consequence of rapid urbanisation

A large number of new Chinese neighbourhoods have emerged after continuous urbanisation processes in the last two decades. A specific investigation into the current spatial form of Chinese urban neighbourhoods has been a core objective of this research. The analysis of urban spatial transformation in Chapter 6 represents the dynamics of new-era housing development in Shenzhen. The designated urban capacity in the city's initial master plans has been greatly exceeded by the accelerated urbanisation. A contradiction exists between the large and increasing urban population and the very limited urban land in Shenzhen metropolis.

What has been found in this research is a vast spatial change of the entire urban environment, especially the rising tendency to apply a higher density and a fragmented pattern as urban form solutions. In addition to an expansion of the entire metropolitan area, the urban development of Shenzhen has additionally focused on its mature inner districts as well. This means that the relocation of housing in suburbs where high-rise development has been strengthened does not necessarily weaken the transformation in central areas. Looking at the central areas revealed that spatial movements appear to be different to the indication from some previous research of a concentrated approach of suburbanisation (Cartier, 2002), as the land redevelopment is still largely carried out in inner areas of Shenzhen for residential purposes. The growth of urban density is one prominent appearance; the reduction of site scale could also provide more opportunities for housing. The two directions of spatial transformation have thus led to the emergence of a large number of high-density, small-scale neighbourhoods. This indicates that urban form may

have been split and distorted by external forces during the recent rapid urbanisation.

Another important characteristic of the new neighbourhood is its gated form, which has become dominant throughout the country. This feature is remarkably different from many Western urban contexts and their neighbourhood developments. The privatisation of urban neighbourhoods is advocated by developers in China, who even treat a neighbourhood purely from a estate sale perspective that can be largely created as a product from an assembly line. However, unique neighbourhood spaces occur as a result of the privatised development under a public/collective land policy. For a neighbourhood, inner facilities and public space are commonly shared by all residents. However, most segmented neighbourhoods and their gated inner spaces are often far from the attention of urban policies and are treated as private housing issues for developers and residents. The apparent lack of concern to understand this in planning policy may have, in turn, accelerated the indulgences of privatised neighbourhoods and disorderly development.

In summary, vast spatial changes have occurred in China during the past decades following rapid urbanisation. A new kind of urban form has been shaped by private sector-led developments. The gated neighbourhoods also comprise a great mixture of different patterns in a varied range of scale and density. The vague semi-open spaces and uneven allocation of facilities in and between neighbourhoods may also occur as a consequence of this significant spatial change and also a consequence of pressures and constraints of urban development in Chinese megacities. However, what has also emerged eventually, after the massive creation of new neighbourhoods is an increasing concern about the sustainability of these neighbourhoods. The great spatial change may have also brought in a potentially great social impact which needs further exploration.

11.1.2 Understanding the social sustainability of neighbourhoods

Along with the spatial alteration, a great transformation of social form and people's relationships in China have been discovered by this research. In this transitional period, people who used to be organised by the old 'work units' have now been reorganised by the market economy and relocated into self-selected geographic neighbourhoods. The social capital of a neighbourhood has not been well formed, as the majority of inhabitants do not know each other well when they start to live in a new urban neighbourhood. As a new social structure is reshaped under a vast change of spatial environment, this form may be frangible and questionable. As discussed in Chapter 3, the promotion of economic

development may have been overemphasised in China, which was mainly and previously determined by planners and developers inside the system. More attention on the environmental perspective has also emerged with a rigid restriction on urban lands and requirement for ecological protection is becoming more prominent. Although the importance of social sustainability has been highlighted in both the literature and the evidence from Shenzhen, based on the wide agreements among related stakeholders, there is a gap in fully interpreting the core elements of social sustainability as well as assessing indicators in China, especially related to the tangible neighbourhood development. This indicates that the social sustainability aspect has not been equally considered in the planning process and neighbourhood development so far. This is further confirmed by this research via an empirical case study in Shenzhen.

The research methodology conceptualised neighbourhood social sustainability by a three-layered framework, basic needs, social networks and community development. This framework presents a dynamic process of developing a socially sustainable neighbourhood from a time-related dimension. Linkages between each layer can be further found. Cultivating social cohesion and enhancing social interaction based on neighbourhood spaces and atmospheres, the first layer, 'basic needs', is potentially associated with the next layer, 'social networks'. Furthermore, a robust social network also contributes to neighbourhood stability and shapes the strong social capital for neighbourhood self-governance. Generated from the intrinsic logic of neighbourhood development, this three-layered framework can be broadly applied to different urban contexts. Hence, the conceptualisation of neighbourhood social sustainability has a theoretical contribution to the knowledge of urban planning and urban sustainability.

The social sustainability assessment was undertaken under this new structure. And a systematic appraisal was further conducted by using deliberately selected indicators that particularly works in the Chinese urban context. According to the findings from Chapter 7,8 and 9, China's current planning system mainly focus on the first-level basic needs development, with strong physical inputs in the construction of public facilities, which has been evident with much positive social satisfaction towards their services. However, over time, the latter community development cannot be limited to the physical input; an evolved mechanism for enhancing smart governance and resilient growth is required. This is suspected to be a missing part of the current system. Thus, highlighting social sustainability

should penetrate throughout the entire neighbourhood development process with a focus on the long term.

11.1.3 Understanding the nexus between urban form and social sustainability

What is the premise of this research is a potential nexus between social sustainability and urban form. This has been initially discussed by some studies (Bramley and Power, 2009), but a specific focus on Chinese neighbourhoods with a strong evidence base is still lacking. Using the typology method, this research has compared five typical categories of neighbourhoods and two different configurations of urban blocks. **Unequal degrees of social sustainability do** exist among these different urban form patterns, and are further proved to be related to spatial variations. In summary, urban form has suggested the following influences on social sustainability:

A stratified ranking for individual neighbourhoods can be reported. The pattern of medium density in either large or medium scales (LSMD and MSMD) appears to be the best form, with a great deal of social sustainability merits. Two other medium-scale developments with either high or low-density range (MSHD, MSLD) are ranked at the intermediate level. The high-density small-scale pattern (SSHD) is discovered to be the most unsustainable form, with significant weaknesses that have been demonstrated in the three-layered appraisal of social sustainability. The role that urban forms play in an upper-scale perspective (urban block, administration community) has also been addressed. Compared with a fragmented pattern, a more integrated form is found to provide a higher level of social sustainability. The above two-level assessments are linked because many small site developments together directly create a fragmented pattern of urban block at an upper scale.

Furthermore, the gated neighbourhood pattern could also be a potential obstacle on the path of improving social sustainability. The evidence indicates its specific enclosed inner boundaries are associated with spatial imbalance and social inequity. However, from the time dimension of neighbourhood development, the impact of urban form has presented a decreasing trend due to its gradually weakening influence on social interaction and community management. By contrast, the attributes of neighbourhood members and social factors have emerged and effectively influence the social sustainability through a long-term process.

11.1.4 Reflection on the current planning process and recommendations for a socially sustainable neighbourhood development

The above-discovered relationship between urban form and social sustainability is a significant finding for the related urban planning process. Variations in the degree of social sustainability have been revealed among the different types of spatial patterns, and the type of SSHD representing the high-density, small-scale development has been proved to be a real obstacle to neighbourhood social sustainability. Clearly, a largely increase in this unsustainable pattern means some defects and deficiencies exist inside the current planning system. Hence, a thorough understanding of the problem requires a review of the system itself. During the research interviews, the voices of some of the residents and organisations criticised unsustainable neighbourhoods as a typical mistake by planners. However, the spatial regulation of the form of urban neighbourhoods is a systematic process; the combinations of different variables have to be finished at different planning and design stages by different planners and designers. Furthermore, the perspective of the government is virtually confined to the facilities and spaces with clear public attributes. There is no further action it can take against the unclear gated inner-neighbourhood facilities and spaces, which have indeed been shaped as a special phenomenon during the recent accelerated urbanisation process. Hence, unsustainable patterns of development are not created by any planner, institution or developer by individual mistakes; the issue comes from the current planning system itself. Therefore, recommendations for a long-term sustainable neighbourhood development could only be made after identifying the defects inside the planning system and process. The following text identifies these defects and suggests ways in which to deal with them.

System weakness 1: A lack of clear guidance and effective control on urban form

Chinese urban form is traditionally shaped by each detailed controlling variable through a explicitly hierarchical planning process. However, so far there is no existing explicit guideline on how to create an ideal sustainable urban form. Some factors associated with social sustainability lack effective guidance, such as the site scale and building coverage ratio, as their proper ranges are mostly unclear to Chinese planners. Another core variable density, represented in the Chinese planning system as FAR, greatly lacks a legal rigid regulation in the implementation process. The lack of real power through regulation connives in the production of unsustainable urban forms, and the potential weak and entrenched across-departmental cooperation may even exacerbate the disordered urban form. This not

only presents the issue of unawareness of the backwardness of some unsustainable development modes, such as fragmentation because of a small-scale development and intensification by a high-density development, but also highlights the defects in the operationalisation of spatial regulation and weaknesses in the entire planning process. Regarding the findings in Chapter 6 about the recent spatial feature of Shenzhen's neighbourhoods, a large number of the unsustainable patterns have recently emerged. The out of control nature of these developments is either actively or passively related to the rush of developers to make profits taking advantage of the boosted housing demands. However, an overwhelming emphasis on the economic perspective also shows a distorted planning benchmark and responsibility. It demonstrates that, with the rapid urbanisation process, if the current planning system is not powerful and transparent enough to supervise urban development, rushed-in capital and interest from the local land economy could overthrow the sustainable development without any consideration of the long-term implications.

Recommendation 1: Creating a robust urban form

The planning process should of course enhance the guidance of the core variables towards a good social sustainability from the outset. Synthesised control of neighbourhood form variables and recommended ideal socially sustainable patterns have been proposed in Chapter 10. However, to guide future development, different methods have to be applied regarding the new areas and existing areas. For new town development, medium density with either large-scale or medium-scale development can both be accepted as the best urban form options. Decisions should also respect considerations of the transport factor. Another important piece of evidence is that urban fragmentation with gated pattern is indeed not sustainable. This is another special response to the prevalent gated neighbourhood form. For new development, a united urban form should be emphasised, which hopefully can underpin better social sustainability at the very beginning. For existing urban regeneration, the ideal urban form is the medium-scale, medium-density mode, although it may yield to the reality and requirements of varied stakeholders. Different from the Western countries' neighbourhood context, some semi-public spaces and facilities are unique in many gated neighbourhoods but currently stand beyond any concern of both the public and the private developments. In all, the control of the variables of urban form has to be enhanced, which includes both the horizontal and vertical control. There has to be a specially proposed rigid regulation preventing the urban form from adopting a super-high

density and fragmented small sites. In the earlier planning and design phases, each neighbourhood project needs to be more stringently reviewed to protect the rights of residents. And to move towards an integrated urban form, local planning processes should also strive to reduce spatial segmentation and enhance resource sharing at an upper scale.

System Weakness 2: A lack of a socially collaborative planning mechanism

The current planning mechanism lacks three different types of collaborations between different stakeholders. First, internal coordination of government departments has to be improved. As discussed in Chapter 5, there may have been some sustainable strategies at the city and district levels. Special plans for each type of facilities have also been proposed recently and initial consideration of spatial balance and social equity has been given within urban blocks. Nevertheless, the implementation of these plans have not targeted or integrated the bottom-scale development and thus cannot realistically benefit the masses. An integrated plan for the community-neighbourhood level is necessary. The research has revealed that the imbalance and inequity at bottom-scale can be seen as a consequence of a lack of control at the lowest planning level, a potential weakness of the current top-down planning approach. Secondly, the creation of unsustainable urban form patterns is implicated as being related to the non-transparent decision-making process which excludes public engagement. The targeted interviews in Chapter 10 have revealed that public involvement is still weak throughout the entire process of making plans, despite an increase in the circulation of planning results by the government and the possibility of social comments and feedback. Indeed, involvement cannot be made if the public voice can only be included at the final stage of discussing the results. Wide discussions at the plan-making stage based on comprehensive points of views which represent all involved stakeholders can shape much better cooperation and a strong partnership. The top-down planning approach currently often focuses on public territories which have a clear boundary. It greatly emphasises the development of public facilities; however, it marginalises the concerns about neighbourhoods and some semi-open spaces. On the other side, the private developers may also feel that it is difficult for them to provide necessary facilities by themselves and that they thus require a larger-scale cooperation. This is especially typical in terms of the severe shortages of neighbourhood parking spaces and public spaces, as neither the local authority nor their developers have paid attention to these issues. Thus, a public-private partnership should be established towards achieving better social development.

Recommendation 2: Towards shaping a cooperative social form

Although the physical planning at present is still a key focus in China, the findings in Chapters 8 and 9 have indicated that it is unable to solve all future issues for neighbourhoods regarding long-term social development. Achieving social sustainability can also come from discovering the processes in which different stakeholders are involved. Sustaining and coordinating spatial resources thus need long-term consideration. In fact, a built environment is not equal to a community. The community is, in fact, the software for the hardware of the built environment (Jackson et al., 2012). It is important to remember that social sustainability cannot grow from a purely cold physical environment, but needs to be cultivated as a part of a passionate, warm social system. Thus, the essence of urban development should have a strong synchrony with urban form and its related social form.

Furthermore, the traditional top-down urban governance has also been feeble in effectively managing the new neighbourhood format, and has even hindered the evolution of new social capital. Recommendations for urban policies should emphasise a collaborative approach and bottom-up perspective in future neighbourhood development. The bottom-up mode requires the growths of residents' committees, a new kind of community planner, and, more crucially, a cooperative system to reunite the separate neighbourhoods. A public-private collaboration is essential so that it can reorganise the split resources and mend the gap for some marginal areas. This would also hopefully drive some presently unsustainable neighbourhoods back to the right track under an enhancement of the provision of facilities and services through a united social form. The following recommendations are proposed as crucial steps for future neighbourhood development: developing the ability of neighbourhood autonomy; advancing service and management with great public engagement and collaboration across different neighbourhoods; and making community regeneration plans via a collaborative approach. The above analysis suggests a strong reaction; in addition to recommending the development of urban space by people in the previous section, it is about the people ultimately managing the space, which is supposed to be a more efficient and targeted solution which returns to the essence of urban planning.

In summary, the occurrence of these unsustainable forms in the rapid urbanisation process can be described as a system error or a 'periodic problem' which appeared in China's special

transitional period. The lack of clear guidelines is a clear gap in the planning regulation system. Entrenched inter-governmental coordination and non-collaborative decision-making processes remain extra causes which reduced the effectiveness of creating a robust urban form during the planning process. Avoiding making similar mistakes in the future requires a systemic adjustment. Enhancing neighbourhood social sustainability in the future contains two dimensions: creating a robust urban form and a corresponding cooperative social form, which also means further collaboration between the earlier planning stage and later governance stage. Therefore, the real system's problem is not only about deciding which kind of urban form is more proper, but is also about whether there is a right process to create a robust urban form eventually.

Enhancing a public-private partnership is recommended, not only for the process of shaping socially sustainable neighbourhoods, but also for the entire planning process that brings the force to fill the gap in many fields. In fact, a real sustainable urban form should be created through a wide collaboration by linking everyone who is involved and shaping a joint effort.

11.2 Research limitations

The first limitation concerns the research methodology. The neighbourhood social sustainability framework is conceptualised on a three-layered design and a series of indicators that are applied in the assessment. However, there is no universal agreement on the definition and inclusion of social sustainability itself, and the framework and indicators are both generated according to a literature review regarding recent and related theoretical studies. Some indicators may be subjective and have not been fully tested due to the current insufficient amount of empirical studies in this area. Moreover, all 30 indicators have been equally treated without any weighting technology. An additional uncontrollable factor is the process of the neighbourhood survey. A large number of assessment results are based on the respondent answers to the questionnaire survey. Due to the limited sample size, there might be a bias between these samples and the real entire populations. This is a common puzzle in social science which needs to be further addressed. Due to the limited research period, the observation of people's activities at randomly selected dates and times within limited observational periods means that the observation results were not continuous and could occasionally be biased due to some abnormal circumstances that happened inside neighbourhoods. Some data provided by the local authority could have been improved, although it is very complicated in the real world. The local crime reports

from police do not contain exact locations of the crimes that occur in neighbourhoods. These could have been further identified with greater processes so that unsafe spaces could be narrowed and the explanations could be clearer. Due to the lack of data, some indicators, for example, household occupancy stability, could not be transversely compared with that at the city level. The GIS database, as stated in Chapter 5, has some data missing for the urban density (FAR) information for numerous neighbourhoods that were built before 2000. There could be room for improvement if the necessary data could be provided or further collected.

The second constraint is about the generalisability of the case study. There is a clear boundary that the appraisal results in this research could only make sense in the Chinese context and may not be appropriate to be applied in other countries. Even for China, the empirical study result is still from the use of one single case of Shenzhen, where the occurrence of massive urban growth in recent decades is obvious. For some small, Western Chinese cities there would be no similarities in terms of the urbanisation background. Moreover, the case study is based on the evidence of an inner Shenzhen district (Nanshan); the spatial features of neighbourhoods and levels of social sustainability may be slightly different for other outskirt areas. This is due to the imbalanced urban development in Shenzhen and its uneven social structure, for example, a higher proportion of migrant populations reside in the outer districts, so there may be some additional social challenges that have not been included in this case study. In the case selection phase, one principle that was applied was to control unrelated factors, so that the comparison of social sustainability could be mainly concentrated on the influence of urban form and its related planning mechanism. However, in reality, in addition to the urban form and some social-demographic factors, it is possible to have other unknown factors that may potentially impact social sustainability. Furthermore, even if the research can classify them into typical patterns, neighbourhoods may still vary case by case. Thus, the inner group differences may still exist, which have not been discussed in this thesis.

11.3 Future research scope

11.3.1 The uncovered urban form patterns, variables and research areas

First, the case study has selected typical patterns from an initial classification and especially discussed some prevalent categories. However, more existing types of neighbourhood form have been created under the current planning process. Based on the similar typological

method, assessing the social sustainability of these uncovered patterns could be further extended. The categories that have not been focused on in this research should be in the scope of future research. Second, the influence of other co-factors of urban form can be further explored, such as mixed-use and its potential association with social sustainability. Mixed-use has been emphasised widely as a positive planning strategy, and is generated by rejecting the traditional zoning approach and avoiding the single land use. The current residential land policy in China is encouraging a mixture of commercial spaces in neighbourhood development. However, not enough attention has been given to its real social impacts, especially on neighbourhood stability and safety. Supplementary findings via a targeted assessment can provide a reference for future planning policies. Third, from the view of systematic control, the influence of high density on larger-scale development such as the urban block level has not been identified in this research, although the fragmented land-use mode has been founded as being socially unsustainable in this research. Further appraisals can be considered to underpin the consideration of social sustainability at upper-levels planning practices. Last but not the least, similar techniques can be extrapolated since the national planning system is operated throughout the county. Further exploration can be made regarding the inequity of social development between different districts and even cities.

11.3.2 The application of assessing the planning input by social outcome: the social-spatial interaction

Some existing socio-spatial inequity has been initially revealed in this research. Some causes in the planning process have also been discussed in an attempt to understand the drive and mechanism of this spatial-social interaction. However, so far, a special focus on the link between the spatial input and the social outcome is still rare in both the literature and practice, not to mention an in-depth explanation of this interaction. More empirical studies, especially under the unique Chinese urban context, should be conducted. Additionally, monitoring of social outcomes can be encompassed by the current urban governance system as an extension of the planning implementation. For example, the implementation of statutory plans and housing policies in Shenzhen both require tangible evaluations and necessary feedback. More importantly, in terms of developing planning tools, widely representative and practically assessable index systems and indices can be further established to monitor long-term neighbourhood developments. Future relevant research can provide social satisfaction as a crucial benchmark for evaluating the past planning input. For example, the social satisfaction with educational, commercial and health facilities in this

research can be used to demonstrate the achievement of a spatially balanced development of these facilities in current practices. Meanwhile, a great lack of social satisfaction can be used as a criterion for the failure of a plan, for instance, to objectively judge the super-high-density development. This means an important practitioner scope to improve the social outcome via modifying the planning input in practice.

The interpretation of a huge and complex socio-spatial interaction mechanism seems to be a deficiency in current studies and a difficult task for the future. What this thesis has mostly presented may be only one part of this system, a force from a spatial movement trying to influence social outcomes. However, the potential opposite force may also exist and may be further proved with supporting evidence; especially it is significant to understand how social decline or inequity could, in turn, exacerbate the deterioration of spatial quality. It is also worth examining, via successful empirical cases of a socially collaborative community development, whether this could, in turn, enhance the spatial quality of neighbourhood spaces. These implications could benefit urban planners and designers for a thorough consideration of the meaning of enhancing social sustainability as well as a better understanding of the orientation and pathway of their planning practices.

11.3.3 Social sustainability appraisal and wider policy-making implications

Based on the established new framework and the experience gained from conducting of an empirical study in Shenzhen, social sustainability assessment can be further applied to neighbourhoods in many other Chinese cities. However, this appraisal system can still work for neighbourhoods in other countries by applying some amendments. Two series of social sustainability indicators can be developed in future: common indicators and indicators alterable according to different contexts/circumstances. For instance, sense of belonging and property ownership can be prepared as common indicators. Some indicators in the three layers may vary due to different regulatory and organisational situations in different countries, for example, the facilities' categories and their related social satisfaction. For international comparative studies, assessment results can also be compared by ultimate standardisations.

Moreover, as well as the social outcome, integrated sustainable discussions are also needed before formulating urban policies. Currently, most local plans are separately generated from an economic, environmental or social perspective by corresponding departments, such as planning committee, environmental protection bureau, or social-welfare bureau.

Entrenched arguments between them are not uncommon and the limitation in their insistence on their respective interests is clear. Thus, an integrated decision-making mechanism is urgently required. The core of an urban policy-making process has to balance complex interests in the process of urban development and redevelopment, and rationally allocate and reallocate their costs and benefits. A compensation mechanism may also need to be considered in future sustainability policies, for example, the potential cost of social inequity may need to be reimbursed using the previous benefits of economic development.

For the Chinese planning system, collaboration between different departments is indispensable for developing sustainable neighbourhoods. Currently, the system has met difficulties due to the independent operations of various government branches in the neighbourhood planning process. Integrating land-use planning, regulatory planning, and transport planning has been suggested as crucial for improving the system. Furthermore, it is also crucial to enhance the transparency of the processes of urban planning and urban governance. The Chinese planning system may potentially be addicted to its traditionally top-down mode led by the planning officer, who is currently playing the core role in the conversation between stakeholders and the decision-making process. However, urban development is no longer only the responsibility of local government. Now the process has collected all related sectors and organisations into a complex network, in which the development has to be based on wide cooperation between them. Nowadays, many other stakeholders desire to have a formal and efficient channel to present their demands and opinions. In response to the quickly growing social capital and the discovered weakness of the planning system, developing a participatory, flexible and negotiable system is a future scope. In summary, developing a comprehensive and cooperative planning system should be considered as an important pathway towards urban sustainability. This transformation is a great challenge to the policy-making process and should also be included in the content of the growing nation's institutional reform steps.

11.3.4 A focus of the uprising bottom-up community planning practice in China

The thesis has summarised the current problems that may hinder the development of social sustainability. To move forward, many of the problems that remain inside the system have to be solved. A new community planning system has recently been practised in Shenzhen, which was also regarded as the first attempt at a bottom-up planning mode in China (Shenzhen, 2012a). Regarding the gradual growth of social capital, coordinating

stakeholders have to be considered in the local planning practice in order to minimise social injustice. What the researcher has observed in Shenzhen is the trial of a system improvement via a combination of the traditional top-down hierarchy with the bottom-up approach. Enhancing community-led plans seems to be an initial attempt in making these new plans. Thus, as a continuous focus, the key questions that were proposed in the final discussion section in Chapter 10 could be further examined by tracing the implementation of these new plans; for instance, how could different stakeholders be institutionally organised in a community plan; how could social sustainability be integrated in a more collaborative system guiding neighbourhood regeneration, and what is the new role of a community-based planner? In addition, there will be a large platform for Chinese planners and researchers to discuss the integration of the separate neighbourhood design, the urban block control and upper units' regulations that widely exist in different levels of plans into a new community-led planning system. At the initial stage of attempting socially collaborative planning, the traditional planning approach still has to be maintained for a certain period. However, its methods can be optimised, as suggested in Chapter 10 of this thesis. In the latter phase, the focuses would mainly be on coordinating stakeholders, promoting self-growth and attempting a far-reaching cooperative governance for the gradual growth of mature urban neighbourhoods. It can be also extended with a wide combination of other planning dimensions and perspectives. In all, a socially-oriented planning transformation in China will take a long time effort. It is a long-term goal that requires a continuous future focus.

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APPENDIX 1 QUESTIONNAIRE SAMPLE

QUESTIONAIRE SUVERY:

THE DEVELOPMENT OF SOCIAL SUSTAINABILITY IN SHENZHEN NEIGHBOURHOOD SPACES

Dear residents,

This special survey is conducted by researcher from the University of Liverpool and supported by Urban Planning & Land Resources Commission of Shenzhen Municipality. The survey is about the social sustainable development of your neighbourhood. Your participation will be an important basis for our research. Your opinions will be related to the satisfactions with nearby amenities, services and surrounding spaces. And we also would like to know the your activities inside your neighbourhood and the situation of your of neighbourhood management and governance. These questions are all closely related to your social life, and your support is really appreciated.

This survey will take only about 15 minutes of your time. Please answer the questions on the next page space by filling in the required information. Your participation to this survey is optional. Your full cooperation will be grateful, but you are allowed to answer only part of the questions. The survey is anonymous; your data will also be kept as confidential and will only be used for research purposes.

Neighbourhood Name_____ Case Code____ *Questionnaire Reference No. ____*

Section A

A1. Your gender a. male b. female
A2. Your age _____
A3. Your hukou, are you a registered resident of Shenzhen? a. yes b. no
A4. Your household number _____
A5. In which type do you stay in this neighbourhood?
a. own b. rent c. provided by organization d. with other family members e. others (please state)_____
A6. How long have you stayed in this neighbourhood? _____year
A7. How many household members are staying with you? _____
A8. Your occupation _____
A9. Your educational Level
a. Primary School b. Middle School c. High School d. College e. Bachelor f. Master and above
A10. Your individual monthly income
a.＜¥3000 b. ¥3000-5999 c.¥6000-9999 d. ¥10000-14999 e. ¥15000-19999 f.≥¥20000

Section B

B1. How are you satisfied with these contents which are related with your neighbourhood? Please evaluate by ticking in the following table.

	A. Very unsatisfied	B. Unsatisfied	C. Neutral or hard to say	D. Satisfied	E. Very satisfied
B1-1 Educational Facilities					
B1-2 Healthy Facilities					
B1-3 Commercial Facilities					
B1-4 Cultural Facilities					
B1-5 Social welfare Facilities					
B1-6 Sports Facilities/Playgrounds					
B1-7 Inner Public space					
B1-8 Inner surroundings					
B1-9 Public Transport Accessibility					
B1-10 Parking Spaces					
B1-11 Property Management					
B1-12 Community Service					
B1-13 Perception of Safety					
B1-14 Overall satisfaction with your neighbourhood					

Note: kindergartens, schools are typical educational facilities; hospitals, community health centre are typical health facilities; restaurants, supermarkets are typical commercial facilities; libraries, neighbourhood cultural centres are typical cultural facilities; neighbourhood playgrounds, gyms are typical sports facilities; nursing homes, elderly people caring centres are typical social welfare facilities; local community offices and police stations provide typical community service;

B2. In normal weekdays with normal weather, how long is your daily time spent on activities inside your neighbourhood? ____
B3. And how long is your daily time spent on activities outside your neighbourhood? ____
(Please indicate a numerous time, for example 15mins, 30 mins, 1 hour.)

B4. Which type(s) of activities do you often take? (multiple choice is allowed)

Inside your neighbourhood _____ Outside your neighbourhood_____

a. resting/ sitting for cool b. doing sports/ fitting c. chatting with neighbours d. cultural activities e. others_____

B5. How many neighbours do you know inside this neighbourhood? ____

(Please indicate a number)

B6. How do you feel that neighbour mutual help inside this neighbourhood?

a. means nothing b. not important e. neutral/hard to say c. important d. very important

B7. Have you taken part in any social group/club inside your neighbourhood?

a. Yes____(number) b. No.

B8. Do you think your neighbourhood character is distinctive?

a. not at all b. weak c. neutral/hard to say d. a little distinctive e. very distinctive

B9. Do you have a 'sense of belonging' in this neighbourhood?

a. nothing b. weak c. neutral/hard to say d. more or less have e. very strong

B10. How do you participate in your resident committee affairs?

a. not at all b. little c. neutral/hard to say d. sometimes e. very frequent

B11. How do you participate in your neighbourhood property management?

a. not at all b. little c. neutral/hard to say d. sometimes e. very frequent

B12. How do you think about your resident self-governance in your neighbourhood?

a. very weak b. weak c. neutral/hard to say d. good e. very good

B13. How you think about the cooperation of your neighbourhood with other nearby neighbourhoods?

a. not at all b. weak c. neutral/hard to say d. sometimes e. very frequent

Section C

C1. How do you think about the 'social sustainable development' for a neighbourhood?

a. not at all b. relatively not important c. neutral or hard to say d. relatively important d. very important

C2. Do you think that 'social sustainable development' would be affected by the spatial pattern of a neighbourhood?

a. not at all b. relatively not c. neutral or hard to say d. relatively yes d. highly impact

C3. In your aspect, which factors do you care most for your neighbourhood's social sustainable development? (multiple choice is allowed)

a. external liveability and amenities for your daily-life b. internal liveability and public space c. social interaction inside the neighbourhood d. social cohesion & sense of belonging of your neighbourhood e. neighbourhood stability & safety

f. neighbourhood stewardship & governance g. Others (please list) _____

Thank you very much for your participation.

Do you wish you be contacted in future?

a. No

b. Yes please chose a suitable way and necessary information for further contact

□ By phone (your landline/mobile phone no.)_____ □ By message only

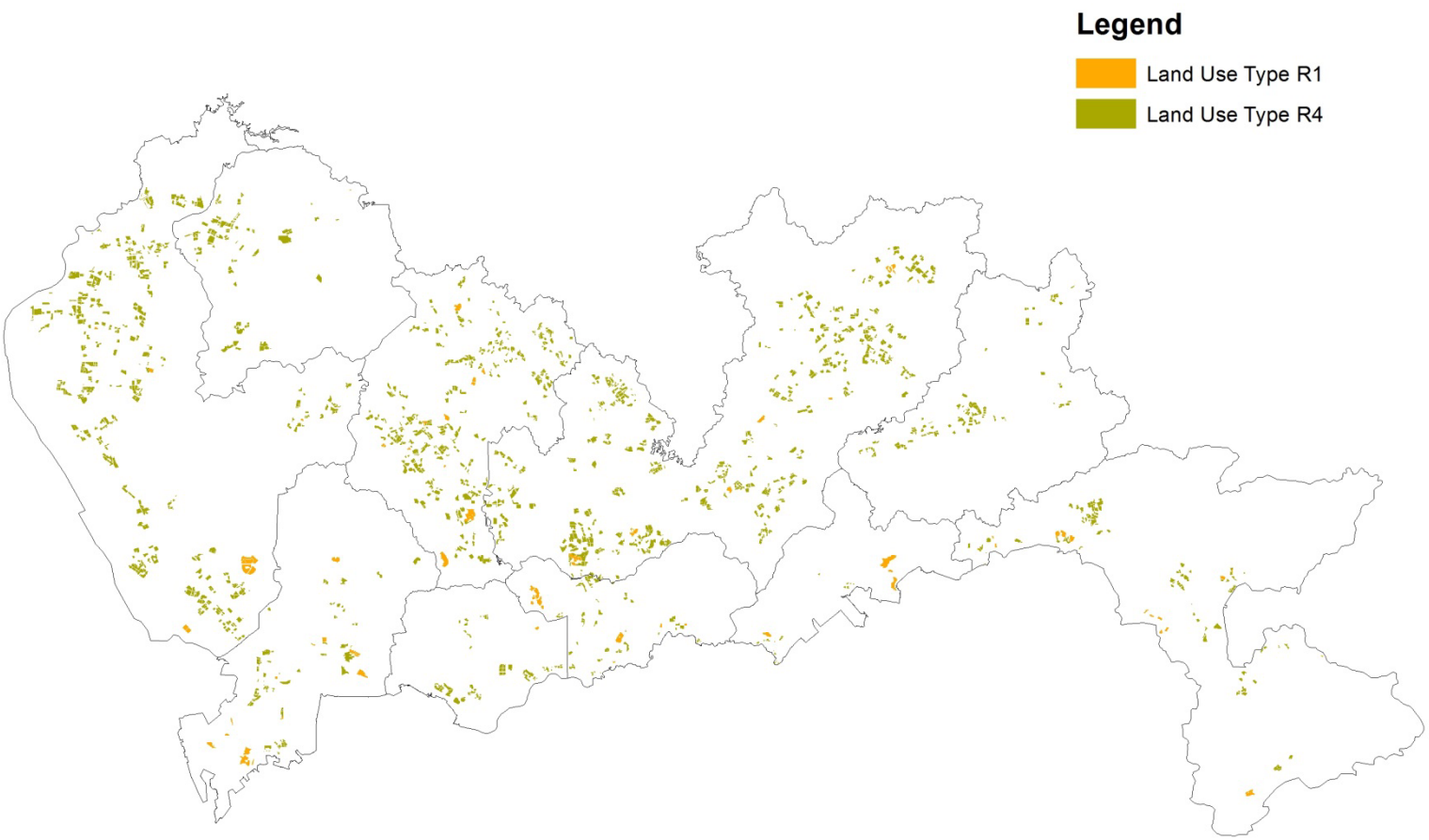
□By e-mail (your email)_____

□By posts (your mailing address) _____

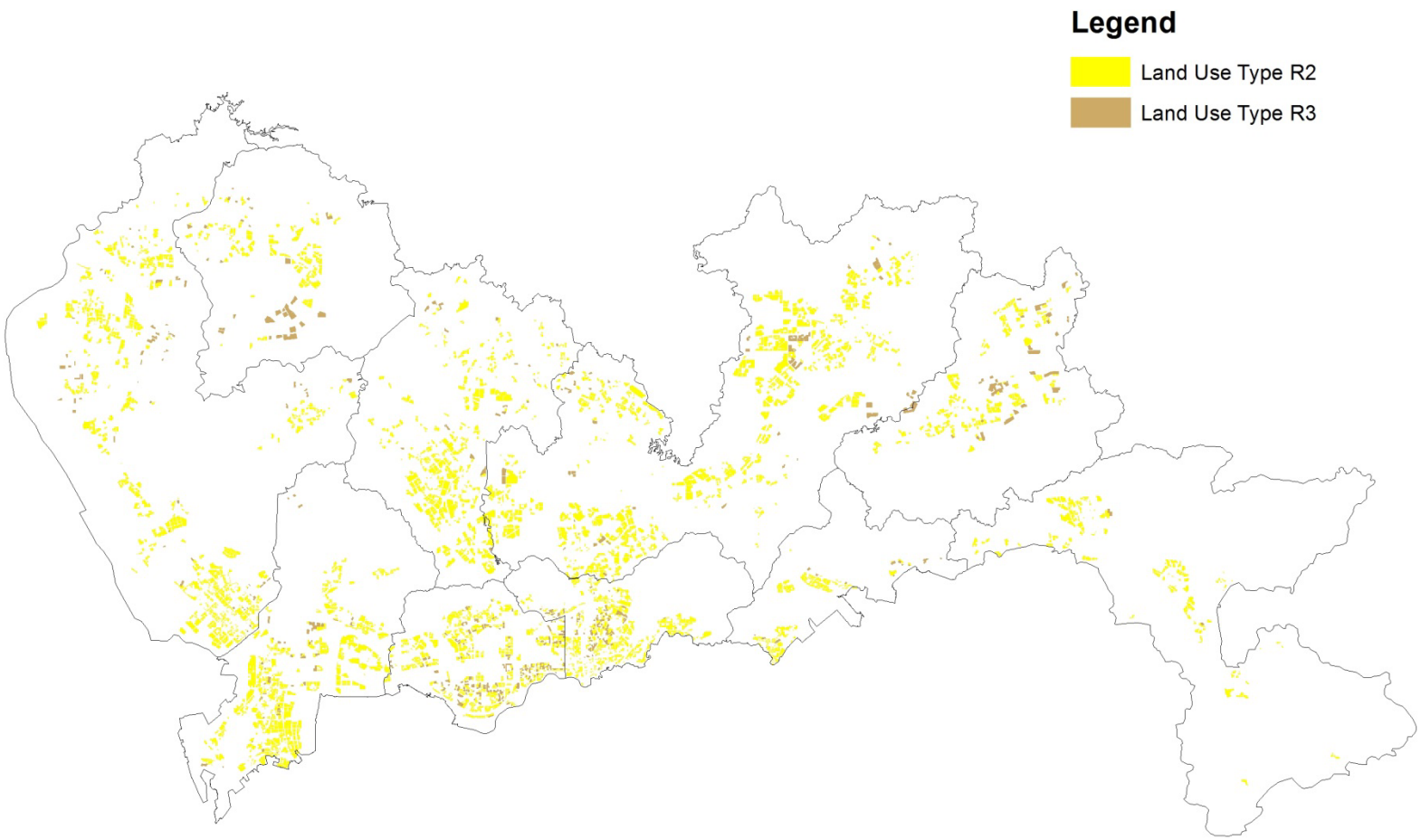
Appendix Table 1.1 Questionnaire response rates

Pattern	Name	Households	Size (hm^2)	Valid samples	Invalid samples	Percentage of population
LSMD-1	Cote D'Azur I	3050	13.7508	45	6	
LSMD-2	Cote D'Azur II	1346	6.9237	35	9	
LSMD Total		**4396**		**80**		**0.6%**
MSHD-1	Wendefu Garden	437	1.9954	27	4	
MSHD-2	Dianli Garden	301	1.1631	21	7	
MSHD Total		**773**		**48**		**2.0%**
MSMD-1	Yude Garden	716	2.8241	25	8	
MSMD-2	Langqinyu	488	2.4211	11	1	
MSMD Total		**1204**		**36**		**1.1%**
MSLD-1	Zhaoshang Mingshi	523	2.9830	11	1	
MSLD-2	Tianhai Garden	315	1.6832	19	1	
MSLD Total		**838**		**30**		**1.2%**
SSHD-1	Ruihuayuan	224	0.2931	19	1	
SSHD-2	Heart of Ocean	452	0.6114	13	0	
SSHD Total		**676**		**32**		**1.6%**
Total in HD		**7852**		**226**	**38**	**1%**

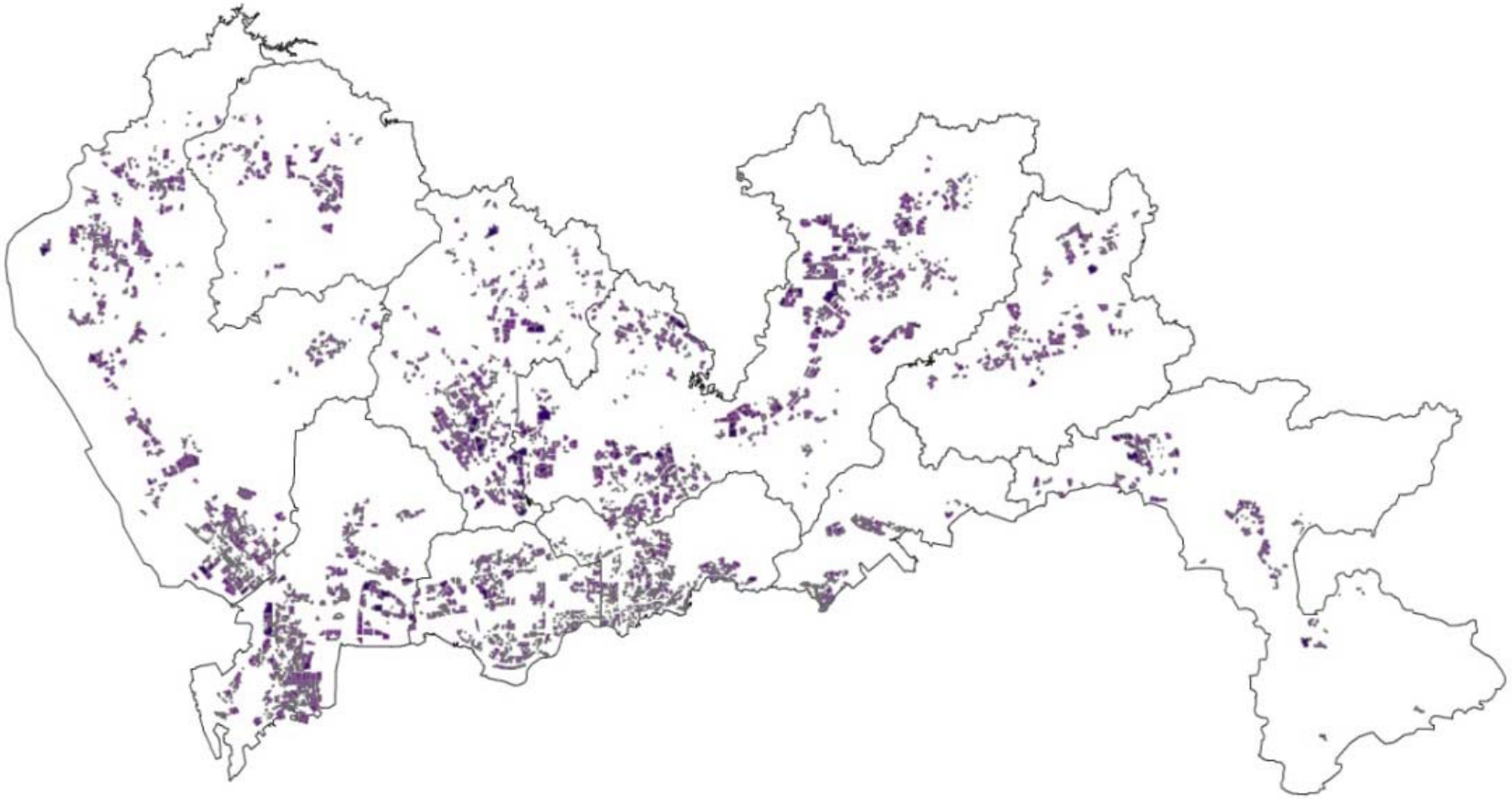
APPENDIX 2 SPATIAL ANALYSES RESULTS



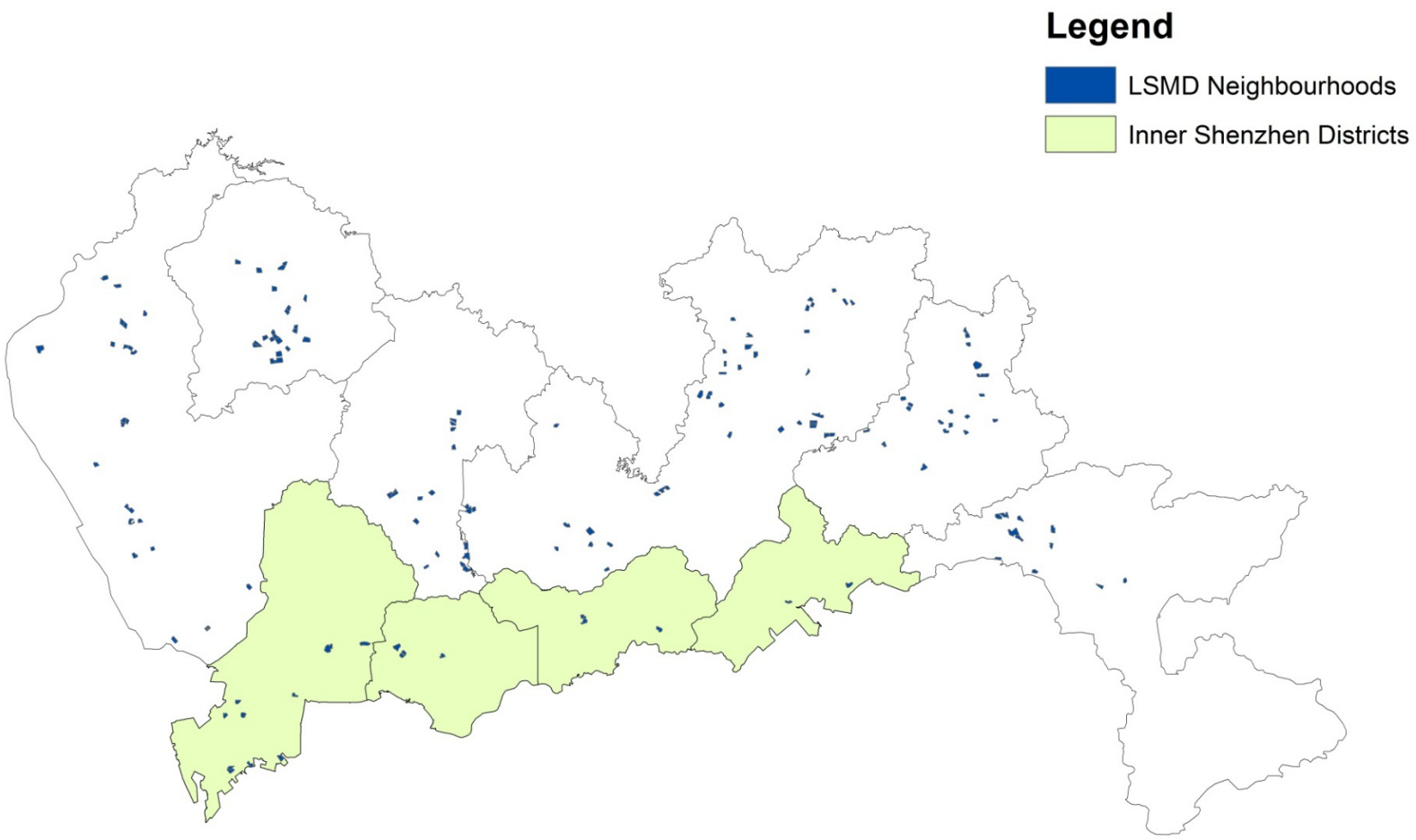
Appendix Figure 2.1 Shenzhen residential land use in the types of R1 and R4



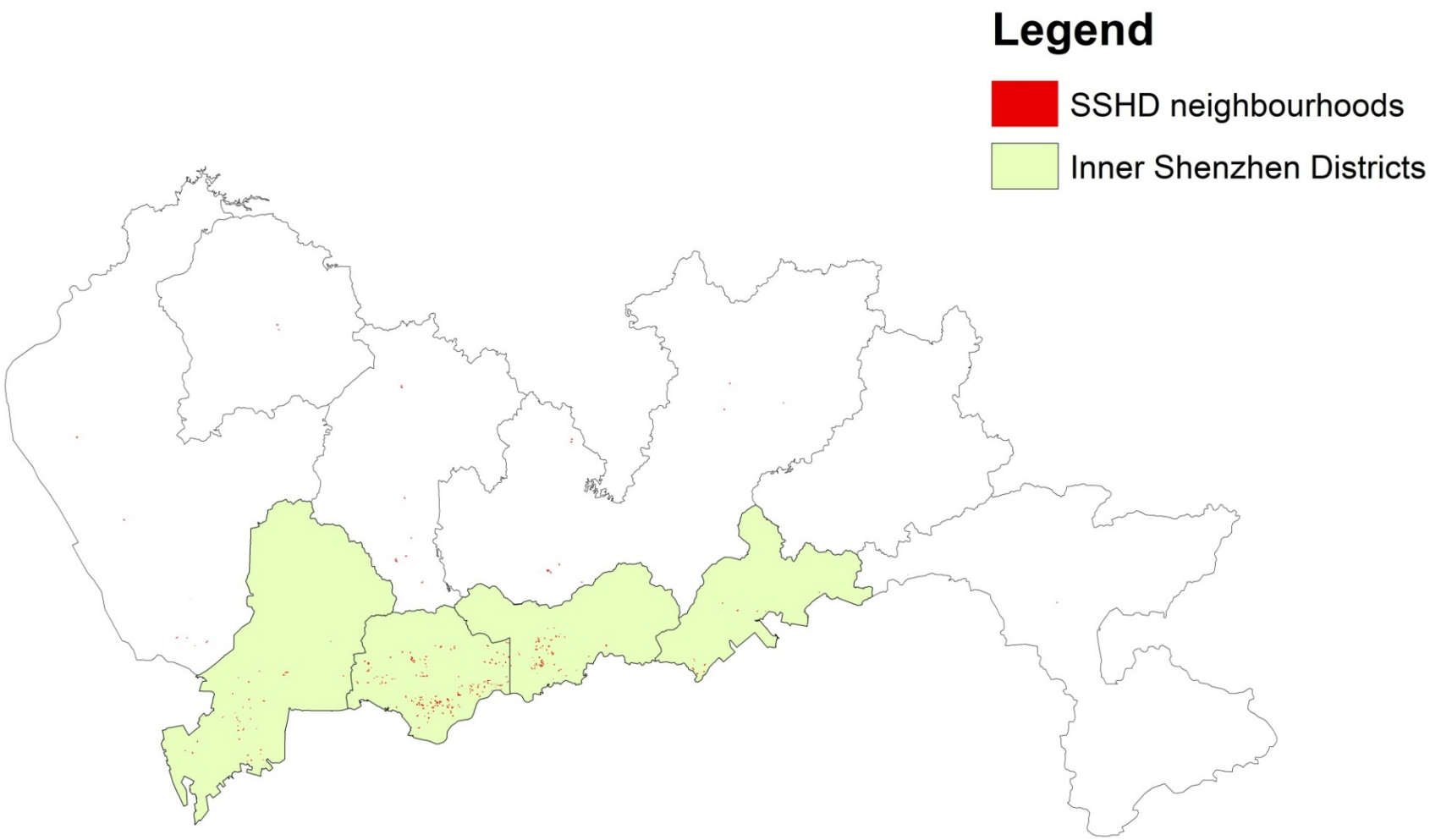
Appendix Figure 2.2 Shenzhen residential land use in the types of R2 and R3



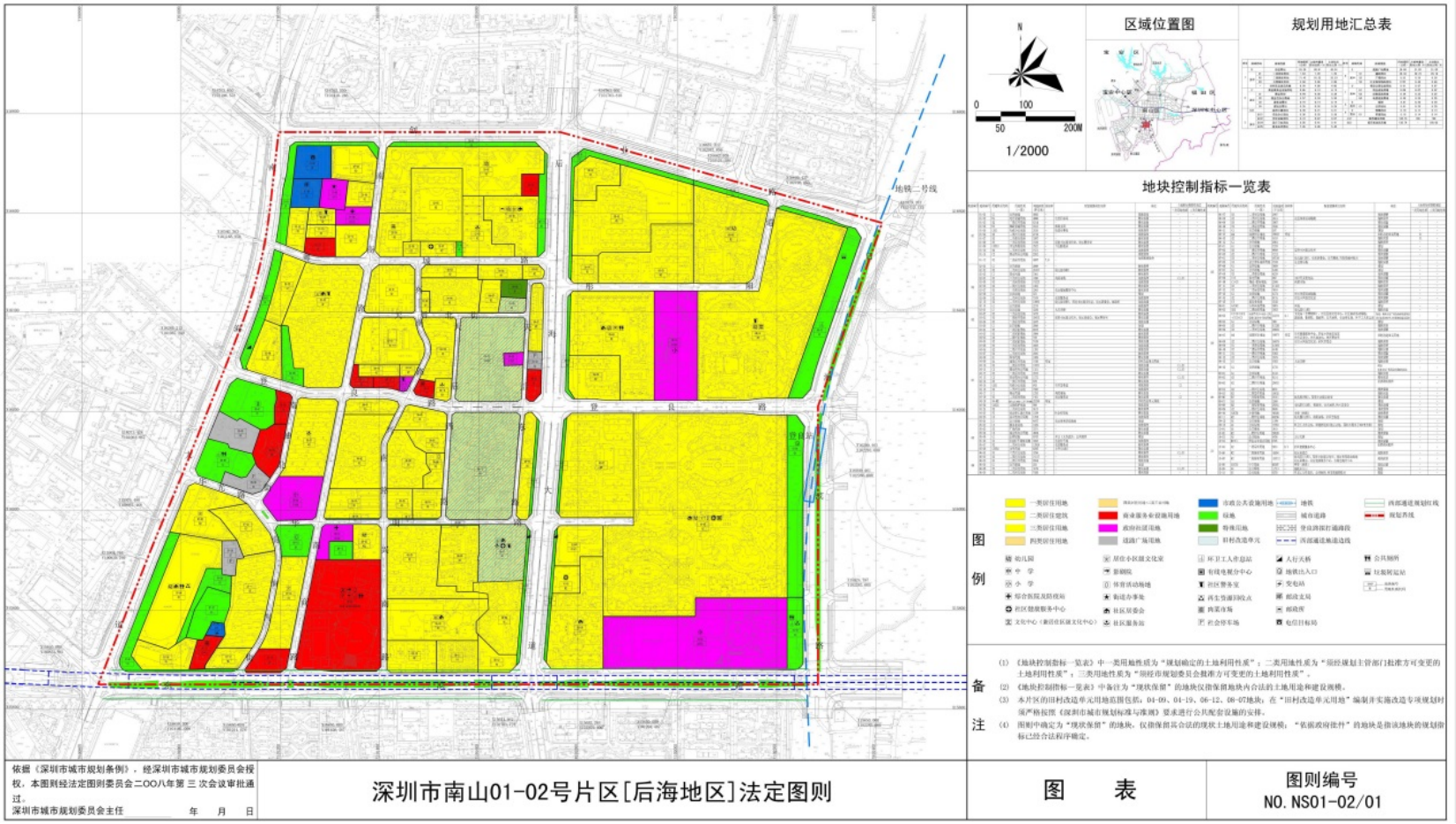
Appendix Figure 2.3 Shenzhen's urban neighbourhoods extracted from city's land-use map



Appendix Figure 2.4 LSMD neighbourhoods are more located in outer districts than inner districts



Appendix Figure 2.5 SSHD neighbourhoods are more located in inner districts than outer districts



Appendix Figure 2.6 The statutory plan of the HD unit NS01-02

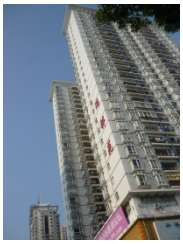
Resource from (Municipality, 2009)

Appendix Figure 2.7 A 3D map of Houhai-Dengliang area

Resource from http://sz.edushi.com/ resource from http://sz.edushi.com/

Appendix Table 2.1 A summary of neighbourhood cases

Form Code	Plot Code and Name	Households	Site Scale (ha)	Population Density (hh/ha)	Gross FAR	Photograph
LSMD-1	A1 Weilan Haian (Cote D'Azur I)	3050	13.75	221.8	3.3	
LSMD-2	B1 Weilan Haian (Cote D'Azur II)	1346	6.92	205.5	2.8	
MSHD-1	A3 Wendefu Garden	437	1.99	219.0	3.9	
MSHD-2	B6 Dianli Garden	301	1.16	259	4.9	
MSMD-1	B2 Yude Garden	716	2.82	192.1	2.0	
MSMD-2	B3 Langqinyu	488	2.42	201.6	2.3	
MSLD-1	A2 Zhaoshang Mingshi	523	2.98	175.3	1.9	

MSLD-2	B4 Tianhai Garden	315	1.68	187	1.8	
SSHD-1	B5 Ruihuayuan	224	0.29	764.2	8.2	
SSHD-2	B7 Heart of Ocean	452	0.61	739.3	7.4	

APPENDIX 3 INTERVIEWEE AND OBSERVATION INFORMATION

Appendix Table 3.1 The Interviewee codes and information

Group	Interviewee Code	Profession
A Planning Officer at SZPL	A1.	Officer, district/regulatory planning department, SZPL
	A2	Officer, master planning department, SZPL
	A3	Officer, SZPL No.1 branch
	A4	Officer, SZPL Longhua branch
B Governmental Planner at SUPRC	B1	Chief Planner, SUPRC
	B2	Director of Public Policy department, SUPRC
	B3	Planner at district/regulatory planning department, SUPRC
	B4	Planner at district/regulatory planning department, SUPRC
C Third Party Planner	C1	Director of Urban Planning Centre of Nanjing University, Shenzhen Branch
D Local Community officer	D1	Chief Officer of Weilan community station, Nanshan district
E Developer	E1	Shenzhen Zhongliang Real Estate
F Resident and Committee	F1	Member of residents committe of neighbourhood 'Cote D'Azur I'
	F2	Secrtary of the residents committee of 'I Cote D'Azur I'
	F3	Resident of 'Cote D'Azur I'
	F4	Resident of Wendefu Garden
G Neighbourhood Management Team	G1	Vice Manager of 'Cote D'Azur I'
	G2	Security manager of 'Cote D'Azur I'

Appendix Table 3.2 On-site observations dates

Case Number	Recorders	Observation 1	Observation 2
A1 Cote D'Azur I	9	18/10/13	24/10/13
A2 Zhaoshang Mingshi	3	18/10/13	24/10/13
A3 Wendefu Garden	3	4/10/13	17/10/13
B1 Cote D'Azur II	4	18/10/13	24/10/13
B2 Yude Garden	2	18/10/13	24/10/13
B3 Langqinyu	2	28/10/13	1/11/13
B4 Tianhai Garden	2	28/10/13	1/11/13
B5 Ruihuayuan	2	25/10/13	31/10/13
B6 Dianli Garden	2	25/10/13	31/10/13
B7 Heart of Ocean	2	25/10/13	31/10/13

Appendix Table 3.3 Observation code for neighbourhood-based activities

Types of activities	Inclusion	Code
necessary activities (NA)	Go to school, back from work, go shopping, others	Unable to record
optional activities (OA)	Individual resting in public space	O
	Individual standing or circulating nearby	X
	Individual playing with child	Cc
	Individual doing sports	Δ
	Others activities, like playing with pets	□
social activities (SA).	Greetings, meetings, chatting & conversations	3● (3people)
	Group people with children	**CCCccc**
	Groups doing outdoor sports, like badminton, football	5▲ (5people)
	Groups in public cultural activities/ events like dancing, playing games/cards	4■ (4people)

APPENDIX 4 STATISTICAL TESTS RESULTS

Appendix Table 4.1 Means of the indicators of 'Basic Needs'

Indicators	Pattern	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	Upper Bound
7.1	LSMD	80	3.90	.989	.111	3.68	4.12
SF_EF	MSHD	48	4.04	.713	.103	3.83	4.25
Educational Facilities	MSMD	36	4.22	.540	.090	4.04	4.41
	MSLD	30	4.07	.785	.143	3.77	4.36
	SSHD	32	3.97	.695	.123	3.72	4.22
	Total	226	4.01	.808	.054	3.91	4.12
7.2	LSMD	80	3.73	.954	.107	3.51	3.94
SF_ HF	MSHD	48	3.71	.771	.111	3.48	3.93
Healthy Facilities	MSMD	36	3.69	.889	.148	3.39	4.00
	MSLD	30	3.63	.890	.162	3.30	3.97
	SSHD	32	3.44	1.014	.179	3.07	3.80
	Total	226	3.66	.905	.060	3.55	3.78
7.3	LSMD	80	4.11	.994	.111	3.89	4.33
SF_CF	MSHD	48	4.02	.911	.131	3.76	4.29
Commercial Facilities	MSMD	36	4.06	.860	.143	3.76	4.35
	MSLD	30	4.20	.610	.111	3.97	4.43
	SSHD	32	3.91	.928	.164	3.57	4.24
	Total	226	4.07	.899	.060	3.95	4.18
7.4	LSMD	80	3.06	1.071	.120	2.82	3.30
SF_SW	MSHD	48	2.67	1.078	.156	2.35	2.98
Social Welfare Facilities	MSMD	36	3.08	.967	.161	2.76	3.41
	MSLD	30	2.73	.785	.143	2.44	3.03
	SSHD	32	2.41	.979	.173	2.05	2.76
	Total	226	2.85	1.032	.069	2.71	2.98
7.5	LSMD	80	3.59	1.002	.112	3.36	3.81
SF_CF	MSHD	48	3.23	1.057	.153	2.92	3.54
Cultural Facilities	MSMD	36	3.50	.878	.146	3.20	3.80
	MSLD	30	3.37	.964	.176	3.01	3.73
	SSHD	32	3.13	1.040	.184	2.75	3.50
	Total	226	3.40	1.003	.067	3.27	3.53
7.6	LSMD	80	3.51	1.136	.127	3.26	3.77
SF_SF	MSHD	48	2.79	1.271	.183	2.42	3.16
Sports Facilities	MSMD	36	3.25	1.105	.184	2.88	3.62
	MSLD	30	2.70	1.055	.193	2.31	3.09
	SSHD	32	2.63	1.289	.228	2.16	3.09
	Total	226	3.08	1.221	.081	2.92	3.24
7.7	LSMD	80	4.05	.673	.075	3.90	4.20
SF_PU	MSHD	48	3.15	1.148	.166	2.81	3.48
Public Space	MSMD	36	3.75	.732	.122	3.50	4.00
	MSLD	30	2.27	.980	.179	1.90	2.63
	SSHD	32	2.25	1.270	.225	1.79	2.71
	Total	226	3.32	1.183	.079	3.16	3.47
7.8	LSMD	80	4.04	.770	.086	3.87	4.21
SF_IS	MSHD	48	3.15	1.203	.174	2.80	3.50
Inner Surroundings	MSMD	36	3.89	.747	.125	3.64	4.14
	MSLD	30	2.73	1.143	.209	2.31	3.16
	SSHD	32	2.72	1.276	.226	2.26	3.18
	Total	226	3.46	1.144	.076	3.31	3.61
7.9	LSMD	80	4.44	.744	.083	4.27	4.60
SF_TR	MSHD	48	3.81	.915	.132	3.55	4.08
Public Transport	MSMD	36	4.28	.701	.117	4.04	4.52
	MSLD	30	4.23	.430	.079	4.07	4.39
	SSHD	32	4.06	.759	.134	3.79	4.34
	Total	226	4.20	.778	.052	4.10	4.30
7.10	LSMD	80	2.70	1.152	.129	2.44	2.96
SF-PS	MSHD	48	2.98	1.158	.167	2.64	3.32
Parking Spaces	MSMD	36	2.61	1.128	.188	2.23	2.99
	MSLD	30	2.20	.847	.155	1.88	2.52
	SSHD	32	1.88	1.008	.178	1.51	2.24
	Total	226	2.56	1.142	.076	2.41	2.71

Appendix Table 4.2 Repeated ANOVA measurement for Likert-scale indicators of 'Basic Needs'

Tests of Within-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	
bneffect	Sphericity Assumed	590.028	9	65.559	84.689	.000	.273
	Greenhouse-Geisser	**590.028**	**7.088**	**83.245**	**84.689**	**.000**	**.273**
	Huynh-Feldt	590.028	7.342	80.366	84.689	.000	.273
	Lower-bound	590.028	1.000	590.028	84.689	.000	.273
Error(bneffect)	Sphericity Assumed	1567.572	2025	.774			
	Greenhouse-Geisser	1567.572	1594.776	.983			
	Huynh-Feldt	1567.572	1651.902	.949			
	Lower-bound	1567.572	225.000	6.967			

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	27086.273	1	27086.273	7752.447	.000	.972
Error	786.127	225	3.494			

bneffect	Mean	Std. Error	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
SF_ED	4.013	.054	3.907	4.119
SF_HE	3.664	.060	3.545	3.782
SF_CM	4.066	.060	3.948	4.184
SF_SW	2.845	.069	2.710	2.980
SF_CL	3.403	.067	3.271	3.534
SF_SP	3.084	.081	2.924	3.244
SF_PU	3.319	.079	3.163	3.474
SF_IS	3.465	.076	3.315	3.614
SF_TR	4.199	.052	4.097	4.301
SF_PK	2.562	.076	2.412	2.712

Pairwise Comparisons

(I) bneffect		Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b] Lower Bound	Upper Bound
SF_EF	SF_HF	.350*	.073	.000	.108	.591
	SF_CM	-.053	.069	1.000	-.280	.174
	SF_SW	1.168*	.083	.000	.893	1.443
	SF_CL	.611*	.069	.000	.383	.838
	SF_SP	.929*	.088	.000	.640	1.219
	SF_PU	.695*	.088	.000	.402	.987
	SF_IS	.549*	.089	.000	.256	.842
	SF_TR	-.186	.066	.251	-.405	.034
	SF_PK	1.451*	.094	.000	1.142	1.761
SF_HF	SF_EF	-.350*	.073	.000	-.591	-.108
	SF_CM	-.403*	.080	.000	-.667	-.138
	SF_SW	.819*	.080	.000	.554	1.083
	SF_CL	.261	.082	.072	-.009	.531
	SF_SP	.580*	.089	.000	.285	.874
	SF_PU	.345*	.087	.004	.058	.633
	SF_IS	.199	.093	1.000	-.108	.506
	SF_TR	-.535*	.072	.000	-.774	-.297
	SF_PK	1.102*	.087	.000	.815	1.388
SF_CM	SF_EF	.053	.069	1.000	-.174	.280
	SF_HF	.403*	.080	.000	.138	.667
	SF_SW	1.221*	.085	.000	.941	1.501
	SF_CL	.664*	.079	.000	.401	.926

	SF_SP	.982*	.094	.000	.673	1.292
	SF_PU	.748*	.092	.000	.445	1.050
	SF_IS	.602*	.090	.000	.304	.900
	SF_TR	-.133	.056	.847	-.318	.053
	SF_PK	1.504*	.089	.000	1.209	1.800
	SF_EF	-1.168*	.083	.000	-1.443	-.893
	SF_HF	-.819*	.080	.000	-1.083	-.554
	SF_CM	-1.221*	.085	.000	-1.501	-.941
	SF_CL	-.558*	.079	.000	-.819	-.296
SF_SW	SF_SP	-.239	.079	.128	-.501	.023
	SF_PU	-.473*	.080	.000	-.736	-.210
	SF_IS	-.619*	.082	.000	-.890	-.349
	SF_TR	-1.354*	.076	.000	-1.604	-1.104
	SF_PK	.283*	.080	.021	.020	.547
	SF_EF	-.611*	.069	.000	-.838	-.383
	SF_HF	-.261	.082	.072	-.531	.009
	SF_CM	-.664*	.079	.000	-.926	-.401
	SF_SW	.558*	.079	.000	.296	.819
SF_CL	SF_SP	.319*	.084	.008	.042	.595
	SF_PU	.084	.088	1.000	-.206	.374
	SF_IS	-.062	.088	1.000	-.352	.228
	SF_TR	-.796*	.073	.000	-1.038	-.555
	SF_PK	.841*	.093	.000	.534	1.147
SF_SP	SF_EF	-.929*	.088	.000	-1.219	-.640
	SF_HF	-.580*	.089	.000	-.874	-.285
	SF_CM	-.982*	.094	.000	-1.292	-.673
	SF_SW	.239	.079	.128	-.023	.501
	SF_CL	-.319*	.084	.008	-.595	-.042
	SF_PU	-.235	.080	.165	-.498	.029
	SF_IS	-.381*	.087	.001	-.669	-.092
	SF_TR	-1.115*	.087	.000	-1.401	-.829
	SF_PK	.522*	.096	.000	.206	.838
	SF_EF	-.695*	.088	.000	-.987	-.402
	SF_HF	-.345*	.087	.004	-.633	-.058
	SF_CM	-.748*	.092	.000	-1.050	-.445
	SF_SW	.473*	.080	.000	.210	.736
SF_PU	SF_CL	-.084	.088	1.000	-.374	.206
	SF_SP	.235	.080	.165	-.029	.498
	SF_IS	-.146	.060	.672	-.343	.051
	SF_TR	-.881*	.081	.000	-1.147	-.615
	SF_PK	.757*	.087	.000	.470	1.043
	SF_EF	-.549*	.089	.000	-.842	-.256
	SF_HF	-.199	.093	1.000	-.506	.108
	SF_CM	-.602*	.090	.000	-.900	-.304
	SF_SW	.619*	.082	.000	.349	.890
SF_IS	SF_CL	.062	.088	1.000	-.228	.352
	SF_SP	.381*	.087	.001	.092	.669
	SF_PU	.146	.060	.672	-.051	.343
	SF_TR	-.735*	.076	.000	-.986	-.483
	SF_PK	.903*	.092	.000	.600	1.205
	SF_EF	.186	.066	.251	-.034	.405
	SF_HF	.535*	.072	.000	.297	.774
	SF_CM	.133	.056	.847	-.053	.318
	SF_SW	1.354*	.076	.000	1.104	1.604
SF_TR	SF_CL	.796*	.073	.000	.555	1.038
	SF_SP	1.115*	.087	.000	.829	1.401
	SF_PU	.881*	.081	.000	.615	1.147
	SF_IS	.735*	.076	.000	.483	.986
	SF_PK	1.637*	.085	.000	1.356	1.918
	SF_EF	-1.451*	.094	.000	-1.761	-1.142
	SF_HF	-1.102*	.087	.000	-1.388	-.815
	SF_CM	-1.504*	.089	.000	-1.800	-1.209
	SF_SW	-.283*	.080	.021	-.547	-.020
SF_PK	SF_CL	-.841*	.093	.000	-1.147	-.534
	SF_SP	-.522*	.096	.000	-.838	-.206
	SF_PU	-.757*	.087	.000	-1.043	-.470
	SF_IS	-.903*	.092	.000	-1.205	-.600
	SF_TR	-1.637*	.085	.000	-1.918	-1.356

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Appendix Table 4.3 The variations of basic needs satisfaction between neighbourhoods

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
7.1 SF-EF_Educational Facilities	1.846	4	221	.121
7.2 SF-HF_Healthy Facilities	1.583	4	221	.180
7.3 SF-CM_Commercial Facilities	.944	4	221	.439
7.4 SF_SW Social Welfare Facilities	2.164	4	221	.074
7.5 SP-CF_Cultural Facilities	.812	4	221	.519
7.6 SF-SP_Sports Facilities	1.681	4	221	.155
7.7 SF-PU_Public Space*	16.535	4	221	.000
7.8 SF_IS Inner Surroundings*	18.003	4	221	.000
7.9 SF_TR Public Transport	2.186	4	221	.072
7.10 SF-PK Parking Spaces*	5.175	4	221	.001

* Homogeneity of variances was violated in three Italic indicators, but running a Welch F test can be an alternative solution for their ANOVA tests.

ANOVA Test and Welch Test results

		Sum of Squares	df	Mean Square	F	Sig.
7.1 SF_EF Educational Facilities	Between Groups	2.786	4	.696	1.068	.373
	Within Groups	144.174	221	.652		
	Total	146.960	225			
7.2 SF_HF Healthy Facilities	Between Groups	2.095	4	.524	.635	.638
	Within Groups	182.347	221	.825		
	Total	184.442	225			
7.3 SF_CF Commercial Facilities	Between Groups	1.630	4	.408	.499	.736
	Within Groups	180.374	221	.816		
	Total	182.004	225			
7.4 SF_SW Social Welfare Facilities	Between Groups	13.890	4	3.473	3.400	**.010**
	Within Groups	225.690	221	1.021		
	Total	239.580	225			
7.5 SF_CL Cultural Facilities	Between Groups	7.025	4	1.756	1.770	.136
	Within Groups	219.333	221	.992		
	Total	226.358	225			
7.6 SF_SF Sports Facilities	Between Groups	30.948	4	7.737	5.616	**.000**
	Within Groups	304.454	221	1.378		
	Total	335.403	225			
7.9 SF_TR Public Transport	Between Groups	12.576	4	3.144	5.628	**.000**
	Within Groups	123.464	221	.559		
	Total	136.040	225			

Welch Test (Robust Tests of Equality of Means)

		Statistic[a]	df1	df2	Sig.
7. 7 SF_PU Public Space	Welch	33.304	4	84.595	**.000**
7.8 SF_IS Inner Surroundings	Welch	16.667	4	85.772	**.000**
7. 10 SP_PK Parking Spaces	Welch	6.621	4	93.457	**.000**

a. Asymptotically F distributed.

Appendix Table 4.4 Multiple comparisons between each group: Basic Needs (I Tukey HSD Test)

Dependent Variable	(I) Form	(J) Form	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
7.4 SF-SW (Social-Welfare Facilities)	LSMD	MSHD	.396	.185	.205	-.11	.90
		MSMD	-.021	.203	1.000	-.58	.54
		MSLD	.329	.216	.550	-.27	.92
		SSHD	**.656***	**.211**	**.018**	**.07**	**1.24**
	MSHD	LSMD	-.396	.185	.205	-.90	.11
		MSMD	-.417	.223	.337	-1.03	.20
		MSLD	-.067	.235	.999	-.71	.58
		SSHD	.260	.231	.791	-.37	.89
	MSMD	LSMD	.021	.203	1.000	-.54	.58
		MSHD	.417	.223	.337	-.20	1.03
		MSLD	.350	.250	.628	-.34	1.04
		SSHD	**.677***	**.246**	**.049**	.00	1.35
	MSLD	LSMD	-.329	.216	.550	-.92	.27
		MSHD	.067	.235	.999	-.58	.71
		MSMD	-.350	.250	.628	-1.04	.34
		SSHD	.327	.257	.708	-.38	1.03
	SSHD	LSMD	**-.656***	**.211**	**.018**	-1.24	-.07
		MSHD	-.260	.231	.791	-.89	.37
		MSMD	**-.677***	**.246**	**.049**	-1.35	.00
		MSLD	-.327	.257	.708	-1.03	.38
7.5 SP_CL Cultural Facilities	LSMD	MSHD	.358	.182	.284	-.14	.86
		MSMD	.088	.200	.992	-.46	.64
		MSLD	.221	.213	.839	-.37	.81
		SSHD	.463	.208	.176	-.11	1.04
	MSHD	LSMD	-.358	.182	.284	-.86	.14
		MSMD	-.271	.220	.732	-.87	.33
		MSLD	-.138	.232	.976	-.78	.50
		SSHD	.104	.227	.991	-.52	.73
	MSMD	LSMD	-.088	.200	.992	-.64	.46
		MSHD	.271	.220	.732	-.33	.87
		MSLD	.133	.246	.983	-.54	.81
		SSHD	.375	.242	.532	-.29	1.04
	MSLD	LSMD	-.221	.213	.839	-.81	.37
		MSHD	.138	.232	.976	-.50	.78
		MSMD	-.133	.246	.983	-.81	.54
		SSHD	.242	.253	.875	-.45	.94
	SSHD	LSMD	-.463	.208	.176	-1.04	.11
		MSHD	-.104	.227	.991	-.73	.52
		MSMD	-.375	.242	.532	-1.04	.29
		MSLD	-.242	.253	.875	-.94	.45
7.6 SP_SF Sports Facilities	LSMD	**MSHD**	**.721***	**.214**	**.008**	.13	1.31
		MSMD	.263	.236	.799	-.39	.91
		MSLD	**.813***	**.251**	**.012**	.12	1.50
		SSHD	**.888***	**.246**	**.003**	.21	1.56
	MSHD	LSMD	-.721*	.214	.008	-1.31	-.13
		MSMD	-.458	.259	.393	-1.17	.25
		MSLD	.092	.273	.997	-.66	.84
		SSHD	.167	.268	.971	-.57	.90
	MSMD	LSMD	-.263	.236	.799	-.91	.39
		MSHD	.458	.259	.393	-.25	1.17
		MSLD	.550	.290	.323	-.25	1.35
		SSHD	.625	.285	.187	-.16	1.41
	MSLD	LSMD	-.813*	.251	.012	-1.50	-.12
		MSHD	-.092	.273	.997	-.84	.66
		MSMD	-.550	.290	.323	-1.35	.25
		SSHD	.075	.298	.999	-.75	.90
	SSHD	LSMD	-.888*	.246	.003	-1.56	-.21
		MSHD	-.167	.268	.971	-.90	.57
		MSMD	-.625	.285	.187	-1.41	.16
		MSLD	-.075	.298	.999	-.90	.75
7.9 SF_TR Public Transport	LSMD	**MSHD**	**.625***	**.136**	**.000**	.25	1.00
		MSMD	.160	.150	.824	-.25	.57
		MSLD	.204	.160	.706	-.24	.64
		SSHD	.375	.156	.120	-.05	.80
	MSHD	**LSMD**	**-.625***	**.136**	**.000**	-1.00	-.25
		MSMD	**-.465***	**.165**	**.041**	-.92	-.01
		MSLD	-.421	.174	.114	-.90	.06
		SSHD	-.250	.171	.586	-.72	.22
	MSMD	LSMD	-.160	.150	.824	-.57	.25
		MSHD	**.465***	**.165**	**.041**	.01	.92
		MSLD	.044	.185	.999	-.46	.55
		SSHD	.215	.182	.760	-.28	.71
	MSLD	LSMD	-.204	.160	.706	-.64	.24
		MSHD	.421	.174	.114	-.06	.90
		MSMD	-.044	.185	.999	-.55	.46
		SSHD	.171	.190	.897	-.35	.69
	SSHD	LSMD	-.375	.156	.120	-.80	.05
		MSHD	.250	.171	.586	-.22	.72
		MSMD	-.215	.182	.760	-.71	.28
		MSLD	-.171	.190	.897	-.69	.35

*. The mean difference is significant at the 0.05 level.

Appendix Table 4.5 Multiple comparisons between each group: Basic Needs (II Games-Howell Test)

Dependent Variable	(I) Form	(J) Form	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
7.7 SF_PU Public Space	LSMD	**MSHD**	**.904***	**.182**	**.000**	.39	1.41
		MSMD	.300	.143	.236	-.10	.70
		MSLD	**1.783***	**.194**	**.000**	1.23	2.34
		SSHD	**1.800***	**.237**	**.000**	1.12	2.48
	MSHD	**LSMD**	**-.904***	**.182**	**.000**	-1.41	-.39
		MSMD	**-.604***	**.206**	**.034**	-1.18	-.03
		MSLD	**.879***	**.244**	**.005**	.20	1.56
		SSHD	**.896***	**.279**	**.017**	.11	1.68
	MSMD	LSMD	-.300	.143	.236	-.70	.10
		MSHD	**.604***	**.206**	**.034**	.03	1.18
		MSLD	**1.483***	**.217**	**.000**	.87	2.10
		SSHD	**1.500***	**.256**	**.000**	.78	2.22
	MSLD	LSMD	**-1.783***	.194	.000	-2.34	-1.23
		MSHD	**-.879***	.244	.005	-1.56	-.20
		MSMD	**-1.483***	.217	.000	-2.10	-.87
		SSHD	.017	.287	1.000	-.79	.83
	SSHD	LSMD	**-1.800***	.237	.000	-2.48	-1.12
		MSHD	**-.896***	.279	.017	-1.68	-.11
		MSMD	**-1.500***	.256	.000	-2.22	-.78
		MSLD	-.017	.287	1.000	-.83	.79
7.8 SF_IS Inner Surroundings	LSMD	**MSHD**	**.892***	**.194**	**.000**	.35	1.43
		MSMD	.149	.151	.863	-.28	.57
		MSLD	**1.304***	**.226**	**.000**	.66	1.95
		SSHD	**1.319***	**.241**	**.000**	.63	2.01
	MSHD	LSMD	-.892*	.194	.000	-1.43	-.35
		MSMD	-.743*	.214	.007	-1.34	-.15
		MSLD	.413	.271	.554	-.35	1.17
		SSHD	.427	.285	.566	-.37	1.23
	MSMD	LSMD	-.149	.151	.863	-.57	.28
		MSHD	**.743***	**.214**	**.007**	.15	1.34
		MSLD	**1.156***	**.243**	**.000**	.47	1.84
		SSHD	**1.170***	**.258**	**.000**	.44	1.90
	MSLD	**LSMD**	**-1.304***	.226	.000	-1.95	-.66
		MSHD	-.413	.271	.554	-1.17	.35
		MSMD	**-1.156***	.243	.000	-1.84	-.47
		SSHD	.015	.307	1.000	-.85	.88
	SSHD	**LSMD**	**-1.319***	**.241**	**.000**	-2.01	-.63
		MSHD	-.427	.285	.566	-1.23	.37
		MSMD	**-1.170***	**.258**	**.000**	-1.90	-.44
		MSLD	-.015	.307	1.000	-.88	.85
7.10 SF_PK Parking Spaces	LSMD	MSHD	-.279	.211	.677	-.87	.31
		MSMD	.089	.228	.995	-.55	.73
		MSLD	.500	.201	.106	-.06	1.06
		SSHD	**.825***	**.220**	**.003**	.21	1.44
	MSHD	LSMD	.279	.211	.677	-.31	.87
		MSMD	.368	.252	.589	-.33	1.07
		MSLD	**.779***	**.228**	**.009**	.14	1.42
		SSHD	**1.104***	**.244**	**.000**	.42	1.79
	MSMD	LSMD	-.089	.228	.995	-.73	.55
		MSHD	-.368	.252	.589	-1.07	.33
		MSLD	.411	.243	.448	-.27	1.09
		SSHD	**.736***	**.259**	**.046**	.01	1.46
	MSLD	LSMD	-.500	.201	.106	-1.06	.06
		MSHD	**-.779***	**.228**	**.009**	-1.42	-.14
		MSMD	-.411	.243	.448	-1.09	.27
		SSHD	.325	.236	.644	-.34	.99
	SSHD	**LSMD**	**-.825***	**.220**	**.003**	-1.44	-.21
		MSHD	**-1.104***	**.244**	**.000**	-1.79	-.42
		MSMD	**-.736***	**.259**	**.046**	-1.46	-.01
		MSLD	-.325	.236	.644	-.99	.34

*. The mean difference is significant at the 0.05 level.

Appendix Table 4.6 The T-Test results for comparing the basic needs satisfaction of two urban blocks

		Levene's Test		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
7.1 SF_EF Educational Facilities	Equal variances assumed	.569	.451	-.188	224	.851	-.021	.112	-.241	.199
	Equal variances not assumed			-.189	175.181	.850	-.021	.111	-.240	.198
7.2 SF_HF Healthy Facilities	Equal variances assumed	.359	.549	-.013	224	.989	-.002	.125	-.248	.245
	Equal variances not assumed			-.014	179.797	.989	-.002	.123	-.245	.242
7.3 SF_CM Commercial Facilities	Equal variances assumed	1.908	.169	.075	224	.940	.009	.124	-.236	.254
	Equal variances not assumed			.077	187.136	.938	.009	.121	-.229	.248
7.4 SF_SW Social Welfare Facilities	Equal variances assumed	1.752	.187	.648	224	.517	.092	.143	-.189	.373
	Equal variances not assumed			.662	182.292	.509	.092	.140	-.183	.368
7.5 SF_CL Cultural Facilities	Equal variances assumed	1.505	.221	-1.159	224	.248	-.160	.138	-.433	.112
	Equal variances not assumed			-1.145	164.779	.254	-.160	.140	-.437	.116
7.6 SF_SF Sports Facilities	Equal variances assumed	.057	.811	.680	224	.497	.115	.169	-.218	.447
	Equal variances not assumed			.686	176.562	.493	.115	.167	-.215	.444
7.7 SF_PU Public Space	Equal variances assumed	6.630	.011	2.182	224	.030	.353	.162	.034	.672
	Equal variances not assumed			**2.261**	**190.276**	**.025**	**.353**	**.156**	**.045**	**.662**
7.8 SF_IS Inner Surroundings	Equal variances assumed	4.671	.032	1.750	224	.081	.275	.157	-.035	.584
	Equal variances not assumed			1.790	183.406	.075	.275	.154	-.028	.578
7.9 SF_TR Public Transport	Equal variances assumed	.343	.559	-.448	224	.655	-.048	.107	-.260	.164
	Equal variances not assumed			-.430	151.317	.668	-.048	.112	-.269	.173
7.10 SF-PK Parking Spaces	Equal variances assumed	.945	.332	.526	224	.600	.083	.158	-.228	.394
	Equal variances not assumed			.519	165.116	.604	.083	.160	-.233	.399

Appendix Table 4.7 Means of the indicators of 'Social Networks'

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
8.1 Sense of belonging	LSMD	80	4.30	.818	.091	4.12	4.48
	MSHD	48	4.00	.968	.140	3.72	4.28
	MSMD	36	3.94	.924	.154	3.63	4.26
	MSLD	30	4.30	.750	.137	4.02	4.58
	SSHD	32	3.03	1.231	.218	2.59	3.48
	Total	226	4.00	1.011	.067	3.87	4.13
8.2 Perception of neighbourhood character	LSMD	80	3.79	.896	.100	3.59	3.99
	MSHD	48	2.50	1.072	.155	2.19	2.81
	MSMD	36	3.33	1.095	.183	2.96	3.70
	MSLD	30	2.30	1.088	.199	1.89	2.71
	SSHD	32	2.06	1.190	.210	1.63	2.49
	Total	226	3.00	1.240	.082	2.84	3.16
8.3 Neighbour mutual recognition	LSMD	80	21.66	15.623	1.747	18.19	25.14
	MSHD	48	30.48	19.502	2.815	24.82	36.14
	MSMD	36	21.06	15.228	2.538	15.90	26.21
	MSLD	30	31.40	18.805	3.433	24.38	38.42
	SSHD	32	11.84	8.847	1.564	8.65	15.03
	Total	226	23.34	17.255	1.148	21.08	25.60
8.4 Neighbour mutual helpfulness	LSMD	80	3.83	.868	.097	3.63	4.02
	MSHD	48	3.92	.895	.129	3.66	4.18
	MSMD	36	4.14	.683	.114	3.91	4.37
	MSLD	30	4.10	.607	.111	3.87	4.33
	SSHD	32	3.72	1.023	.181	3.35	4.09
	Total	226	3.92	.847	.056	3.80	4.03
8.5 Social group membership	LSMD	80	.70	1.011	.113	.47	.93
	MSHD	48	.33	.559	.081	.17	.50
	MSMD	36	.56	.877	.146	.26	.85
	MSLD	30	.50	1.225	.224	.04	.96
	SSHD	32	.06	.246	.043	-.03	.15
	Total	226	.48	.891	.059	.37	.60
8.6 Subjective time spending on neighbourhood activities	LSMD	80	72.47	38.87	4.35	63.82	81.12
	MSHD	48	72.66	49.99	7.22	58.14	87.17
	MSMD	36	52.08	34.67	5.78	40.35	63.81
	MSLD	30	33.75	36.78	6.72	20.02	47.49
	SSHD	32	30.23	32.86	5.81	18.39	42.08
	Total	226	58.14	43.32	2.88	52.46	63.82
8.7 Subjective frequency of taking activities	LSMD	80	1.86	2.01	0.23	1.41	2.31
	MSHD	48	1.85	3.25	0.47	0.91	2.80
	MSMD	36	1.04	1.27	0.21	0.61	1.47
	MSLD	30	0.87	1.33	0.24	0.37	1.37
	SSHD	32	0.62	1.21	0.21	0.18	1.05
	Total	226	1.42	2.14	0.14	1.14	1.70

Appendix Table 4.8 The variations of 'Social Networks' between neighbourhoods

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
8.1 SOB Sense of Belonging	3.358	4	221	.011
8.2 PNC Perception of neighbourhood character	3.750	4	221	.006
8.3 NMR Neighbour mutual recognition	13.263	4	221	.000
8.4 NMH Neighbour mutual helpfulness	1.562	4	221	.185
8.5 SGM Social Group Membership	10.258	4	221	.000
8.6 LTS Length of time spend on activities	4.593	4	221	.001
8.7 SWP Subjective willingness to participate in activities	2.933	4	221	.022

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
8.1 SOB Sense of Belonging	Between Groups	40.042	4	10.011	11.646	.000
	Within Groups	189.958	221	.860		
	Total	230.000	225			
8.2 PNC Perception of neighbourhood character	Between Groups	108.438	4	27.109	25.219	.000
	Within Groups	237.563	221	1.075		
	Total	346.000	225			
8.3 Neighbour mutual recognition	Between Groups	9037.591	4	2259.398	8.616	.000
	Within Groups	57955.174	221	262.241		
	Total	66992.765	225			
8.4 Neighbour mutual helpfulness	Between Groups	4.712	4	1.178	1.661	.160
	Within Groups	156.691	221	.709		
	Total	161.403	225			
8.5 SGM Social Group Membership	Between Groups	10.699	4	2.675	3.524	.008
	Within Groups	167.731	221	.759		
	Total	178.429	225			
8.6 LTS Length of time spend on activities	Between Groups	70625.602	4	17656.400	11.098	.000
	Within Groups	351593.867	221	1590.922		
	Total	422219.469	225			
8.7 SWP Subjective willingness to participate in activities	Between Groups	59.366	4	14.841	3.378	0.01
	Within Groups	971.074	221	4.394		
	Total	1030.439	225			

Robust Tests of Equality of Means

		Statistic[a]	df1	df2	Sig.
8.1 SOB Sense of Belonging	Welch	7.966	4	88.831	.000
8.2 PNC Perception of neighbourhood character	Welch	25.456	4	87.017	.000
8.3 NMR Neighbour mutual recognition	Welch	12.985	4	92.819	.000
8.5 SGM Social Group Membership	Welch	9.764	4	92.002	.000
8.6 LTS Length of time spend on activities	Welch	12.379	4	92.408	.000
8.7 SWP Subjective willingness to participate in activities	Welch	4.891	4	97.378	.001

a. Asymptotically F distributed.

Appendix Table 4.9 Multiple comparisons between each group: Social Networks (Games-Howell Test)

Dependent Variable	(I) Form	(J) Form	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
8.1 Sense of belonging	LSMD	MSHD	.300	.167	.382	-.17	.77
		MSMD	.356	.179	.285	-.15	.86
		MSLD	.000	.165	1.000	-.46	.46
		SSHD	**1.269***	.236	.000	.60	1.94
	MSHD	LSMD	-.300	.167	.382	-.77	.17
		MSMD	.056	.208	.999	-.53	.64
		MSLD	-.300	.196	.544	-.85	.25
		SSHD	**.969***	.259	.004	.24	1.70
	MSMD	LSMD	-.356	.179	.285	-.86	.15
		MSHD	-.056	.208	.999	-.64	.53
		MSLD	-.356	.206	.426	-.93	.22
		SSHD	**.913***	.267	.010	.16	1.66
	MSLD	LSMD	.000	.165	1.000	-.46	.46
		MSHD	.300	.196	.544	-.25	.85
		MSMD	.356	.206	.426	-.22	.93
		SSHD	**1.269***	.257	.000	.54	2.00
	SSHD	LSMD	**-1.269***	.236	.000	-1.94	-.60
		MSHD	**-.969***	.259	.004	-1.70	-.24
		MSMD	**-.913***	.267	.010	-1.66	-.16
		MSLD	**-1.269***	.257	.000	-2.00	-.54
8.2 Perception of neighbourhood character	LSMD	MSHD	**1.288***	.184	.000	.77	1.80
		MSMD	.454	.208	.202	-.13	1.04
		MSLD	**1.488***	.222	.000	.86	2.12
		SSHD	**1.725***	.233	.000	1.06	2.39
	MSHD	LSMD	**-1.288***	.184	.000	-1.80	-.77
		MSMD	**-.833***	.239	.007	-1.50	-.16
		MSLD	.200	.252	.931	-.51	.91
		SSHD	.438	.261	.456	-.30	1.17
	MSMD	LSMD	-.454	.208	.202	-1.04	.13
		MSHD	**.833***	.239	.007	.16	1.50
		MSLD	**1.033***	.270	.003	.28	1.79
		SSHD	**1.271***	.278	.000	.49	2.05
	MSLD	LSMD	**-1.488***	.222	.000	-2.12	-.86
		MSHD	-.200	.252	.931	-.91	.51
		MSMD	**-1.033***	.270	.003	-1.79	-.28
		SSHD	.238	.289	.923	-.58	1.05
	SSHD	LSMD	**-1.725***	.233	.000	-2.39	-1.06
		MSHD	-.438	.261	.456	-1.17	.30
		MSMD	**-1.271***	.278	.000	-2.05	-.49
		MSLD	-.238	.289	.923	-1.05	.58
8.3 Neighbour mutual recognition	LSMD	MSHD	-8.817	3.313	.069	-18.06	.42
		MSMD	.607	3.081	1.000	-8.02	9.24
		MSLD	-9.738	3.852	.102	-20.68	1.21
		SSHD	**9.819***	2.345	.001	3.30	16.34
	MSHD	LSMD	8.817	3.313	.069	-.42	18.06
		MSMD	9.424	3.790	.104	-1.15	20.00
		MSLD	-.921	4.440	1.000	-13.39	11.55
		SSHD	**18.635***	3.220	.000	9.62	27.65
	MSMD	LSMD	-.607	3.081	1.000	-9.24	8.02
		MSHD	-9.424	3.790	.104	-20.00	1.15
		MSLD	-10.344	4.270	.124	-22.38	1.69
		SSHD	**9.212***	2.981	.025	.82	17.61
	MSLD	LSMD	9.738	3.852	.102	-1.21	20.68
		MSHD	.921	4.440	1.000	-11.55	13.39
		MSMD	10.344	4.270	.124	-1.69	22.38
		SSHD	**19.556***	3.773	.000	8.79	30.32
	SSHD	LSMD	**-9.819***	2.345	.001	-16.34	-3.30
		MSHD	**-18.635***	3.220	.000	-27.65	-9.62
		MSMD	**-9.212***	2.981	.025	-17.61	-.82
		MSLD	**-19.556***	3.773	.000	-30.32	-8.79

Table continued

Dependent Variable	(I) Form	(J) Form	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
8.5 SGM Social group membership	LSMD	MSHD	.367	.139	.069	-.02	.75
		MSMD	.144	.185	.935	-.37	.66
		MSLD	.200	.251	.930	-.51	.91
		SSHD	**.638***	.121	.000	.30	.97
	MSHD	LSMD	-.367	.139	.069	-.75	.02
		MSMD	-.222	.167	.673	-.69	.25
		MSLD	-.167	.238	.955	-.85	.52
		SSHD	**.271***	.092	.033	.01	.53
	MSMD	LSMD	-.144	.185	.935	-.66	.37
		MSHD	.222	.167	.673	-.25	.69
		MSLD	.056	.267	1.000	-.70	.81
		SSHD	**.493***	.152	.019	.06	.93
	MSLD	LSMD	-.200	.251	.930	-.91	.51
		MSHD	.167	.238	.955	-.52	.85
		MSMD	-.056	.267	1.000	-.81	.70
		SSHD	.438	.228	.328	-.22	1.10
	SSHD	LSMD	**-.638***	.121	.000	-.97	-.30
		MSHD	**-.271***	.092	.033	-.53	-.01
		MSMD	**-.493***	.152	.019	-.93	-.06
		MSLD	-.438	.228	.328	-1.10	.22
8.6 LTS Length of time spend on activities	LSMD	MSHD	-.1875	8.4234	1.000	-23.691	23.316
		MSMD	**20.3854***	7.2300	.047	.177	40.594
		MSLD	**38.7188***	7.9989	.000	16.157	61.280
		SSHD	**42.2344***	7.2541	.000	21.899	62.570
	MSHD	LSMD	.1875	8.4234	1.000	-23.316	23.691
		MSMD	20.5729	9.2443	.181	-5.216	46.362
		MSLD	**38.9063***	9.8573	.002	11.342	66.470
		SSHD	**42.4219***	9.2631	.000	16.553	68.290
	MSMD	LSMD	**-20.3854***	7.2300	.047	-40.594	-.177
		MSHD	-20.5729	9.2443	.181	-46.362	5.216
		MSLD	18.3333	8.8592	.247	-6.578	43.244
		SSHD	21.8490	8.1930	.070	-1.132	44.830
	MSLD	LSMD	**-38.7188***	7.9989	.000	-61.280	-16.157
		MSHD	**-38.9063***	9.8573	.002	-66.470	-11.342
		MSMD	-18.3333	8.8592	.247	-43.244	6.578
		SSHD	3.5156	8.8788	.995	-21.480	28.511
	SSHD	LSMD	**-42.2344***	7.2541	.000	-62.570	-21.899
		MSHD	**-42.4219***	9.2631	.000	-68.290	-16.553
		MSMD	-21.8490	8.1930	.070	-44.830	1.132
		MSLD	-3.5156	8.8788	.995	-28.511	21.480
8.7 SWP Subjective willingness to participate in activities	LSMD	MSHD	.0047	.5206	1.000	-1.454	1.463
		MSMD	.8175	.3096	.071	-.042	1.677
		MSLD	**.9889***	.3316	.030	.063	1.915
		SSHD	**1.2427***	.3103	.001	.380	2.106
	MSHD	LSMD	-.0047	.5206	1.000	-1.463	1.454
		MSMD	.8128	.5151	.517	-.633	2.258
		MSLD	.9841	.5286	.348	-.497	2.466
		SSHD	1.2379	.5155	.128	-.209	2.685
	MSMD	LSMD	-.8175	.3096	.071	-1.677	.042
		MSHD	-.8128	.5151	.517	-2.258	.633
		MSLD	.1713	.3230	.984	-.737	1.079
		SSHD	.4251	.3010	.622	-.419	1.270
	MSLD	LSMD	**-.9889***	.3316	.030	-1.915	-.063
		MSHD	-.9841	.5286	.348	-2.466	.497
		MSMD	-.1713	.3230	.984	-1.079	.737
		SSHD	.2538	.3236	.934	-.657	1.165
	SSHD	LSMD	**-1.2427***	.3103	.001	-2.106	-.380
		MSHD	-1.2379	.5155	.128	-2.685	.209
		MSMD	-.4251	.3010	.622	-1.270	.419
		MSLD	-.2538	.3236	.934	-1.165	.657

Appendix Table 4.10 On-site observation results of neighbourhood social interactions

Case	A1	A2	Mean-A	SA 1	SA 2	Mean of SA	OA1	OA2	Mean of OA
LSMD	**974**	**893**	**933.5**	**613**	**508**	**560.5**	**361**	**385**	**373**
LSMD-1	503	495	499	286	267	276.5	217	228	222.5
LSMD-2	471	398	434.5	327	241	284	144	157	150.5
MSHD	**89**	**83**	**86**	**52**	**50**	**51**	**37**	**33**	**35**
MSHD-1	71	66	68.5	42	39	40.5	29	27	28
MSHD-2	18	17	17.5	10	11	10.5	8	6	7
MSMD	**243**	**222**	**232.5**	**155**	**139**	**147**	**88**	**83**	**85.5**
MSMD-1	184	159	171.5	118	101	109.5	66	58	62
MSMD-2	59	63	61	37	38	37.5	22	25	23.5
MSLD	**88**	**85**	**86.5**	**44**	**42**	**43**	**44**	**43**	**43.5**
MSLD-1	70	67	68.5	35	33	34	35	34	34.5
MSLD-2	18	18	18	9	9	9	9	9	9
SSHD	**16**	**15**	**15.5**	**8**	**7**	**7.5**	**8**	**8**	**8**
SSHD-1	10	11	10.5	5	5	5	5	6	5.5
SSHD-2	6	4	5	3	2	2.5	3	2	2.5
Totally									

Note: A-total activities; SA-social activities; OA-other activities

Appendix Table 4.11 The calculation of indicators OFA, SIA, SSA

Neighbourhood	Population	Site Area (ha)	OFA	SIA	SSA
LSMD	15968	20.67	5.8%	45.15	1.50
MSHD	2919	2.00	2.9%	27.23	1.46
MSMD	4159	6.15	5.6%	37.81	1.72
MSLD	2689	4.67	3.2%	18.54	0.99
SSHD	2221	0.90	0.7%	17.14	0.94
Totally	27956	35.54	4.8%	38.10	1.48

OFA= A/Population, SIA=A/Site scale, SSA=SA/OA

Appendix Table 4.12 Paired T-Test for the two repeated observations of social interactions

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	A1	282.00	5	395.609	176.922
	A2	259.60	5	361.978	161.881
Pair 2	SA1	174.40	5	251.208	112.343
	SA2	149.40	5	206.223	92.226

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	A1 & A2	5	1.000	.000
Pair 2	SA1 & SA2	5	1.000	.000

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1	FA1 - FA2	22.400	33.687	15.065	-19.428	64.228	1.487	4	.211
Pair 2	SA1 - SA2	25.000	45.177	20.204	-31.095	81.095	1.237	4	.284

Appendix Table 4.13 The correlations between indicators of social networks

		8.1 SOB	8.2 PNC	8.3 NMR	8.4 NMH	8.5 SGM	8.6 LST	8.7 SWP
8.1 SOB	Correlation Coefficient	1.000	.357**	.373**	.273**	.200**	.248**	.175**
	Sig. (2-tailed)		.000	.000	.000	.002	.000	.009
	N	226	226	226	226	226	226	226
8.2 PNC	Correlation Coefficient	.357**	1.000	-.029	.104	.307**	.328**	.262**
	Sig. (2-tailed)	.000		.666	.121	.000	.000	.000
	N	226	226	226	226	226	226	226
8.3 NMR	Correlation Coefficient	.373**	-.029	1.000	.287**	.301**	.221**	.086
	Sig. (2-tailed)	.000	.666		.000	.000	.001	.199
	N	226	226	226	226	226	226	226
8.4 NMH	Correlation Coefficient	.273**	.104	.287**	1.000	.211**	.143*	.094
	Sig. (2-tailed)	.000	.121	.000		.001	.031	.160
	N	226	226	226	226	226	226	226
8.5 SGM	**Correlation Coefficient**	**.200****	**.307****	**.301****	**.211****	**1.000**	**.184****	**.111**
	Sig. (2-tailed)	**.002**	**.000**	**.000**	**.001**		**.005**	**.096**
	N	226	226	226	226	226	226	226
8.6 LST	**Correlation Coefficient**	**.248****	**.328****	**.221****	**.143***	**.184****	**1.000**	**.758****
	Sig. (2-tailed)	**.000**	**.000**	**.001**	**.031**	**.005**		**.000**
	N	226	226	226	226	226	226	226
8.7 SWP	Correlation Coefficient	.175**	.262**	.086	.094	.111	.758**	1.000
	Sig. (2-tailed)	.009	.000	.199	.160	.096	.000	
	N	226	226	226	226	226	226	226

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix Table 4.14 The occupancy stability of the HD neighbourhoods

Neighbourhood	Household (hh)	Renting hh	Renting Proportion	Non-renting proportion
LSMD	**4396**	**590**	**13.42%**	**86.58%**
LSMD-1	3050	416	13.64%	86.36%
LSMD-2	1346	174	12.93%	87.07%
MSHD	**738**	**162**	**21.95%**	**78.05%**
MSHD-1	437	65	14.87%	85.13%
MSHD-2	301	97	32.23%	67.77%
MSMD	**1204**	**257**	**21.35%**	**78.65%**
MSMD-1	716	167	23.32%	76.68%
MSMD-2	488	90	18.44%	81.56%
MSLD	**838**	**243**	**29.00%**	**71.00%**
MSLD-1	523	125	23.90%	76.10%
MSLD-2	315	118	37.46%	62.54%
SSHD	**676**	**411**	**60.80%**	**39.20%**
SSHD-1	224	136	60.71%	39.29%
SSHD-2	452	275	60.84%	39.16%
Totally	**7852**	**1663**	**0.212**	**0.788**

Appendix Table 4.15 The population stability of the HD neighbourhoods

Neighbourhood	Population (Pp)	Non-Permanent Pp	Non-permanent proportion	Permanent Proportion
LSMD	**15968**	**6761**	**42.34%**	**57.66%**
LSMD-1	11052	4621	41.81%	58.19%
LSMD-2	4916	2140	43.53%	56.47%
MSHD	**2919**	**855**	**29.29%**	**70.71%**
MSHD-1	1559	448	28.74%	71.26%
MSHD-2	1360	407	29.93%	70.07%
MSMD	**4159**	**1622**	**39.00%**	**61.00%**
MSMD-1	2285	840	36.76%	63.24%
MSMD-2	1874	782	41.73%	58.27%
MSLD	**2689**	**855**	**31.80%**	**68.20%**
MSLD-1	1642	419	25.52%	74.48%
MSLD-2	1047	436	41.64%	58.36%
SSHD	**2221**	**1418**	**63.85%**	**36.15%**
SSHD-1	741	453	61.13%	38.87%
SSHD-2	1480	965	65.20%	34.80%
Totally	**27956**	**11511**	**41.18%**	**58.82%**

Appendix Table 4.16 The objective safety of the HD neighbourhoods, using local crime data (2011- Oct 2013)

	Total crime	Daily incidence	Site area	Crime per ha	Daliy ratio per ha	Safety level
LSMD	**122**	**11.84%**	**20.67**	**5.901**	**0.57%**	**99.43%**
LSMD-1	78	7.57%	13.75	5.672	0.55%	99.45%
LSMD-2	44	4.27%	6.92	6.355	0.62%	99.38%
MSHD	**17**	**1.65%**	**3.16**	**5.382**	**0.52%**	**99.48%**
MSHD-1	8	0.78%	2.00	4.009	0.39%	99.61%
MSHD-2	9	0.87%	1.16	7.738	0.75%	99.25%
MSMD	**74**	**7.18%**	**6.15**	**12.035**	**1.17%**	**98.83%**
MSMD-1	61	5.92%	3.73	16.364	1.59%	98.41%
MSMD-2	13	1.26%	2.42	5.369	0.52%	99.48%
MSLD	**25**	**2.43%**	**4.67**	**5.358**	**0.52%**	**99.48%**
MSLD-1	15	1.46%	2.98	5.029	0.49%	99.51%
MSLD-2	10	0.97%	1.68	5.941	0.58%	99.42%
SSHD	**35**	**3.40%**	**0.90**	**38.695**	**3.76%**	**96.24%**
SSHD-1	15	1.46%	0.29	51.177	4.97%	95.03%
SSHD-2	20	1.94%	0.61	32.712	3.18%	96.82%
Total	273	26.50%	35.54	7.679	0.75%	99.25%

Appendix Table 4.17 Means of the indicators of 'Community Development'

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
9.4 Perceived safety	LSMD	80	3.93	.911	.102	3.72	4.13	2	5
	MSHD	48	3.67	1.078	.156	3.35	3.98	1	5
	MSMD	36	3.94	.791	.132	3.68	4.21	2	5
	MSLD	30	3.47	.900	.164	3.13	3.80	2	5
	SSHD	32	3.38	1.157	.205	2.96	3.79	2	5
	Total	226	3.73	.984	.065	3.61	3.86	1	5
9.5 Satisfaction with property management	LSMD	80	3.78	.886	.099	3.58	3.97	2	5
	MSHD	48	3.42	1.028	.148	3.12	3.72	1	5
	MSMD	36	3.72	1.059	.176	3.36	4.08	1	5
	MSLD	30	3.20	1.243	.227	2.74	3.66	1	5
	SSHD	32	3.28	1.198	.212	2.85	3.71	1	5
	Total	226	3.54	1.058	.070	3.41	3.68	1	5
9.6 Satisfaction with community service	LSMD	80	3.79	.882	.099	3.59	3.98	1	5
	MSHD	48	3.15	1.111	.160	2.82	3.47	1	5
	MSMD	36	3.50	.845	.141	3.21	3.79	2	5
	MSLD	30	3.03	.890	.162	2.70	3.37	2	5
	SSHD	32	2.78	1.184	.209	2.35	3.21	1	5
	Total	226	3.36	1.038	.069	3.23	3.50	1	5
9.7 Property management participation	LSMD	80	1.94	1.256	.140	1.66	2.22	1	5
	MSHD	48	1.85	1.238	.179	1.49	2.21	1	5
	MSMD	36	2.19	1.390	.232	1.72	2.66	1	5
	MSLD	30	1.63	.964	.176	1.27	1.99	1	4
	SSHD	32	1.53	.879	.155	1.21	1.85	1	4
	Total	226	1.86	1.201	.080	1.71	2.02	1	5
9.8 Committee affair participation	LSMD	80	2.18	1.456	.163	1.85	2.50	1	5
	MSHD	48	1.71	1.148	.166	1.38	2.04	1	5
	MSMD	36	1.89	1.090	.182	1.52	2.26	1	5
	MSLD	30	1.67	1.093	.200	1.26	2.07	1	5
	SSHD	32	1.56	1.076	.190	1.17	1.95	1	4
	Total	226	1.88	1.255	.083	1.71	2.04	1	5
9.9 Neighbourhood self-governance	LSMD	80	3.53	.968	.108	3.31	3.74	1	5
	MSHD	48	3.54	.824	.119	3.30	3.78	2	5
	MSMD	36	3.64	.867	.144	3.35	3.93	1	5
	MSLD	30	3.43	.971	.177	3.07	3.80	1	5
	SSHD	32	3.00	1.016	.180	2.63	3.37	1	4
	Total	226	3.46	.943	.063	3.34	3.58	1	5
9.10 Neighbourhood mutual collaborations	LSMD	80	2.15	1.360	.152	1.85	2.45	1	5
	MSHD	48	2.35	1.407	.203	1.95	2.76	1	5
	MSMD	36	2.19	1.191	.198	1.79	2.60	1	4
	MSLD	30	2.13	1.196	.218	1.69	2.58	1	4
	SSHD	32	1.59	1.012	.179	1.23	1.96	1	4
	Total	226	2.12	1.289	.086	1.95	2.29	1	5

Appendix Table 4.18 Repeated ANOVA measurement for Likert-scale indicators of 'community development'

Tests of Within-Subjects Effects

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
CD	Sphericity Assumed	984.521	6	164.087	160.947	.000	.417
	Greenhouse-Geisser	**984.521**	**4.088**	**240.811**	**160.947**	**.000**	**.417**
	Huynh-Feldt	984.521	4.173	235.900	160.947	.000	.417
	Lower-bound	984.521	1.000	984.521	160.947	.000	.417
Error(CD)	Sphericity Assumed	1376.336	1350	1.020			
	Greenhouse-Geisser	1376.336	919.879	1.496			
	Huynh-Feldt	1376.336	939.030	1.466			
	Lower-bound	1376.336	225.000	6.117			

Tests of Between-Subjects Effects

Measure: MEASURE_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	12862.908	1	12862.908	4911.719	.000	.956
Error	589.235	225	2.619			

Estimates

Measure:

CD	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
PSA	3.735	.065	3.605	3.864
SF-PM	3.544	.070	3.406	3.683
SF-CS	3.363	.069	3.227	3.499
PA-PM	1.863	.080	1.705	2.020
PA-CA	1.876	.083	1.712	2.041
NSG	3.460	.063	3.337	3.584
NMC	2.119	.086	1.951	2.288

Continued

Pairwise Comparisons

Measure: MEASURE_1

(I) CD	(J) CD	Mean Difference (I-J)	Std. Error	Sig.b	95% Confidence Interval for Differenceb	
					Lower Bound	Upper Bound
9.4 OSA	SF-PM	.190	.063	.063	-.005	.385
	SF-CS	.372*	.071	.000	.152	.591
	PA-PM	1.872*	.101	.000	1.560	2.183
	PA-CA	1.858*	.109	.000	1.522	2.195
	NSG	.274*	.078	.012	.033	.515
	NMC	1.615*	.106	.000	1.289	1.941
9.5 SF-PM	PSA	-.190	.063	.063	-.385	.005
	SF-CS	.181	.073	.289	-.043	.406
	PA-PM	1.681*	.103	.000	1.365	1.998
	PA-CA	1.668*	.109	.000	1.333	2.003
	NSG	.084	.080	1.000	-.163	.331
	NMC	1.425*	.105	.000	1.101	1.749
9.3 SF-CS	PSA	-.372*	.071	.000	-.591	-.152
	SF-PM	-.181	.073	.289	-.406	.043
	PA-PM	1.500*	.102	.000	1.186	1.814
	PA-CA	1.487*	.103	.000	1.172	1.802
	NSG	-.097	.081	1.000	-.345	.150
	NMC	1.243*	.110	.000	.905	1.581
9.4 PA-PM	PSA	-1.872*	.101	.000	-2.183	-1.560
	SF-PM	-1.681*	.103	.000	-1.998	-1.365
	SF-CS	-1.500*	.102	.000	-1.814	-1.186
	PA-CA	-.013	.063	1.000	-.205	.179
	NSG	-1.597*	.096	.000	-1.891	-1.304
	NMC	-.257	.104	.296	-.575	.062
9.5 PA-CA	PSA	-1.858*	.109	.000	-2.195	-1.522
	SF-PM	-1.668*	.109	.000	-2.003	-1.333
	SF-CS	-1.487*	.103	.000	-1.802	-1.172
	PA-PM	.013	.063	1.000	-.179	.205
	NSG	-1.584*	.098	.000	-1.885	-1.283
	NMC	-.243	.111	.614	-.584	.097
9.6 NSG	PSA	-.274*	.078	.012	-.515	-.033
	SF-PM	-.084	.080	1.000	-.331	.163
	SF-CS	.097	.081	1.000	-.150	.345
	PA-PM	1.597*	.096	.000	1.304	1.891
	PA-CA	1.584*	.098	.000	1.283	1.885
	NMC	1.341*	.100	.000	1.033	1.648
9.7 NMC	PSA	-1.615*	.106	.000	-1.941	-1.289
	SF-PM	-1.425*	.105	.000	-1.749	-1.101
	SF-CS	-1.243*	.110	.000	-1.581	-.905
	PA-PM	.257	.104	.296	-.062	.575
	PA-CA	.243	.111	.614	-.097	.584
	NSG	-1.341*	.100	.000	-1.648	-1.033

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Appendix Table 4.19 The variations of 'community development' between neighbourhoods

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
9.4 Perceived safety	4.731	4	221	.001
9.5 Satisfaction with property management	4.555	4	221	.001
9.6 Satisfaction with community service	5.219	4	221	.000
9.7 Property management participation	2.546	4	221	.040
9.8 Committee affair participation	4.510	4	221	.002
9.9 Neighbourhood self-governance	.934	4	**221**	**.445**
9.10 Neighbourhood mutual collaborations	3.614	4	221	.007

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
	Between Groups	10.999	4	2.750	2.935	**.022**
9.4 PSA	Within Groups	207.072	221	.937		
	Total	218.071	225			
	Between Groups	11.950	4	2.987	2.750	**.029**
9.5 SF-PM	Within Groups	240.108	221	1.086		
	Total	252.058	225			
	Between Groups	31.446	4	7.861	8.242	**.000**
9.6 SF-CS	Within Groups	210.802	221	.954		
	Total	242.248	225			
	Between Groups	9.507	4	2.377	1.666	.159
9.7PA-PM	Within Groups	315.241	221	1.426		
	Total	324.748	225			
	Between Groups	12.967	4	3.242	2.098	.082
9.8PA-CA	Within Groups	341.564	221	1.546		
	Total	354.531	225			
	Between Groups	8.603	4	2.151	2.481	**.045**
9.9 NSG	Within Groups	191.539	221	.867		
	Total	200.142	225			
	Between Groups	11.771	4	2.943	1.797	.131
9.10 NMC	Within Groups	362.003	221	1.638		
	Total	373.774	225			

Robust Tests of Equality of Means

		Statistic[a]	df1	df2	Sig.
9.4 Perceived safety	Welch	2.849	4	90.069	**.028**
9.5Satisfaction with property management	Welch	2.564	4	86.232	**.044**
9.6 Satisfaction with community service	Welch	7.852	4	89.250	**.000**
9.7 Property management participation	Welch	1.917	4	93.976	.114
9.8 Committee affair participation	Welch	1.903	4	94.398	.116
9.10 Neighbourhood mutual collaborations	Welch	2.400	4	93.528	.055

a. Asymptotically F distributed.

Appendix Table 4.20 Multiple comparisons between each group: community development (I Games-Howell Test)

Dependent Variable	(I) Form	(J) Form	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
9.4 Perceived safety	LSMD	MSHD	.258	.186	.636	-.26	.78
		MSMD	-.019	.167	1.000	-.48	.45
		MSLD	.458	.193	.139	-.09	1.00
		SSHD	.550	.228	.131	-.10	1.20
	MSHD	LSMD	-.258	.186	.636	-.78	.26
		MSMD	-.278	.204	.654	-.85	.29
		MSLD	.200	.226	.902	-.43	.83
		SSHD	.292	.257	.788	-.43	1.01
	MSMD	LSMD	.019	.167	1.000	-.45	.48
		MSHD	.278	.204	.654	-.29	.85
		MSLD	.478	.211	.170	-.11	1.07
		SSHD	.569	.243	.148	-.12	1.26
	MSLD	LSMD	-.458	.193	.139	-1.00	.09
		MSHD	-.200	.226	.902	-.83	.43
		MSMD	-.478	.211	.170	-1.07	.11
		SSHD	.092	.262	.997	-.65	.83
	SSHD	LSMD	-.550	.228	.131	-1.20	.10
		MSHD	-.292	.257	.788	-1.01	.43
		MSMD	-.569	.243	.148	-1.26	.12
		MSLD	-.092	.262	.997	-.83	.65
9.5 Satisfaction with property management	LSMD	MSHD	.358	.178	.270	-.14	.86
		MSMD	.053	.202	.999	-.52	.62
		MSLD	.575	.248	.159	-.13	1.28
		SSHD	.494	.234	.233	-.17	1.16
	MSHD	LSMD	-.358	.178	.270	-.86	.14
		MSMD	-.306	.231	.676	-.95	.34
		MSLD	.217	.271	.930	-.55	.98
		SSHD	.135	.259	.985	-.59	.86
	MSMD	LSMD	-.053	.202	.999	-.62	.52
		MSHD	.306	.231	.676	-.34	.95
		MSLD	.522	.287	.374	-.29	1.33
		SSHD	.441	.276	.503	-.33	1.22
	MSLD	LSMD	-.575	.248	.159	-1.28	.13
		MSHD	-.217	.271	.930	-.98	.55
		MSMD	-.522	.287	.374	-1.33	.29
		SSHD	-.081	.310	.999	-.95	.79
	SSHD	LSMD	-.494	.234	.233	-1.16	.17
		MSHD	-.135	.259	.985	-.86	.59
		MSMD	-.441	.276	.503	-1.22	.33
		MSLD	.081	.310	.999	-.79	.95
9.6 Satisfaction with community service	LSMD	MSHD	**.642***	.188	.009	.12	1.17
		MSMD	.288	.172	.457	-.19	.77
		MSLD	**.754***	.190	.002	.22	1.29
		SSHD	**1.006***	.231	.001	.35	1.66
	MSHD	LSMD	**-.642***	.188	.009	-1.17	-.12
		MSMD	-.354	.213	.464	-.95	.24
		MSLD	.113	.228	.988	-.53	.75
		SSHD	.365	.264	.641	-.38	1.10
	MSMD	LSMD	-.288	.172	.457	-.77	.19
		MSHD	.354	.213	.464	-.24	.95
		MSLD	.467	.215	.205	-.14	1.07
		SSHD	**.719***	.252	.047	.01	1.43
	MSLD	LSMD	**-.754***	.190	.002	-1.29	-.22
		MSHD	-.113	.228	.988	-.75	.53
		MSMD	-.467	.215	.205	-1.07	.14
		SSHD	.252	.265	.875	-.49	1.00
	SSHD	LSMD	**-1.006***	.231	.001	-1.66	-.35
		MSHD	-.365	.264	.641	-1.10	.38
		MSMD	**-.719***	.252	.047	-1.43	-.01
		MSLD	-.252	.265	.875	-1.00	.49

*. The mean difference is significant at the 0.05 level.

Appendix Table 4.21 Multiple comparisons between each group: community development (II Tukey HSD)

	(I) Form	(J) Form	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
9.9 Neighbourhood self-governance	LSMD	MSHD	-.017	.170	1.000	-.48	.45
		MSMD	-.114	.187	.973	-.63	.40
		MSLD	.092	.199	.991	-.46	.64
		SSHD	.525	.195	.058	-.01	1.06
	MSHD	LSMD	.017	.170	1.000	-.45	.48
		MSMD	-.097	.205	.990	-.66	.47
		MSLD	.108	.217	.987	-.49	.70
		SSHD	.542	.212	.084	-.04	1.13
	MSMD	LSMD	.114	.187	.973	-.40	.63
		MSHD	.097	.205	.990	-.47	.66
		MSLD	.206	.230	.899	-.43	.84
		SSHD	**.639***	.226	**.041**	.02	1.26
	MSLD	LSMD	-.092	.199	.991	-.64	.46
		MSHD	-.108	.217	.987	-.70	.49
		MSMD	-.206	.230	.899	-.84	.43
		SSHD	.433	.237	.358	-.22	1.08
	SSHD	LSMD	-.525	.195	.058	-1.06	.01
		MSHD	-.542	.212	.084	-1.13	.04
		MSMD	**-.639***	.226	**.041**	-1.26	-.02
		MSLD	-.433	.237	.358	-1.08	.22

*. The mean difference is significant at the 0.05 level.

Appendix Table 4.22 T Test results: comparing the service satisfactions of the two local community offices

Group Statistics

	community	N	Mean	Std. Deviation	Std. Error Mean
9.6 SF-CS	1	91	3.692	.9030	.0947
	2	135	3.141	1.0662	.0918

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Difference Error	of the Difference Lower	Upper
9.6 SF-CS	Equal variances assumed	9.504	.002	4.051	224	.000	.5516	.1362	.2833	.8199
	Equal variances not assumed			4.184	212.559	.000	.5516	.1318	.2917	.8114

Appendix Table 4.23 Correlations between urban form, safety indicators and physical control

		Site Scale	FAR	OSA	PSA	CCTV
Site scale	Pearson Correlation	1	-.358	.394	.339	-.316
	Sig. (2-tailed)		.310	.260	.339	.373
	N	10	10	10	10	10
FAR	Pearson Correlation	-.358	1	-.848**	-.355	.682*
	Sig. (2-tailed)	.310		.002	.314	.030
	N	10	10	10	10	10
OSA	Pearson Correlation	.394	-.848**	1	.270	-.582
	Sig. (2-tailed)	.260	.002		.450	.078
	N	10	10	10	10	10
PSA	Pearson Correlation	.339	-.355	.270	1	.207
	Sig. (2-tailed)	.339	.314	.450		.566
	N	10	10	10	10	10
CCTV	Pearson Correlation	-.316	.682*	-.582	.207	1
	Sig. (2-tailed)	.373	.030	.078	.566	
	N	10	10	10	10	10

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).